JUNE 1993 Vol.11 No.4 £2.95

Acorn COMPUTING

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ZOOL EXCLUSIVE

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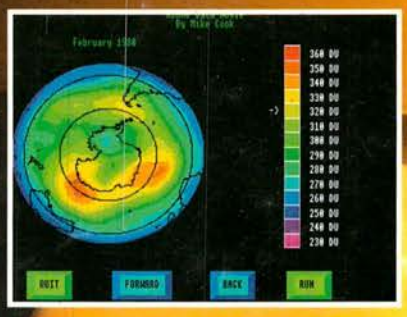

OZONE LAYER

Find out about what's happening to our planet

CITY HEADLINES
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INFOMANIA

We check out four teletext adapters

3-D WORLDS

Now anyone can join in the experience! Special report inside

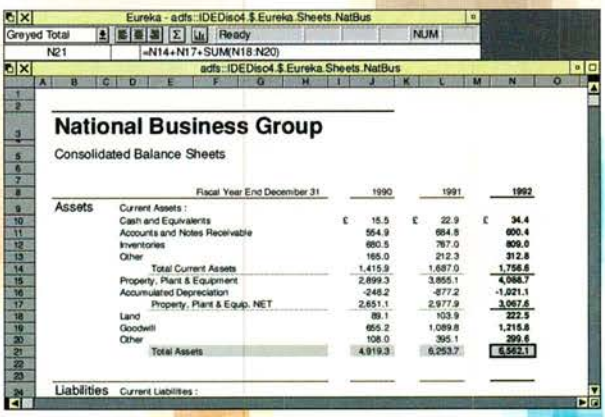
No coverdisk? ask your newsagent

9 770967 525014 06>
EUROPRESS PUBLICATIONS

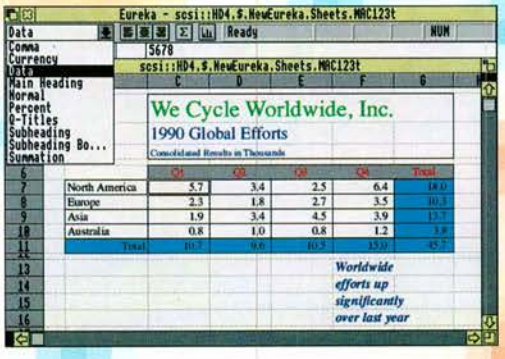
£3,000 DREAM VACATION — Win a fun holiday in the sun

EUREKA!

...FOR PEC
MEAN B

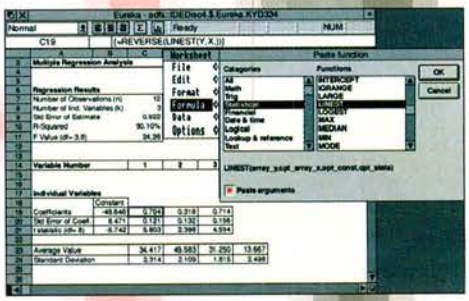


Eureka's advanced DTP-like publishing capabilities encourage you to create the most impressive reports and budgets, making full use of the Acorn Outline Font Manager.



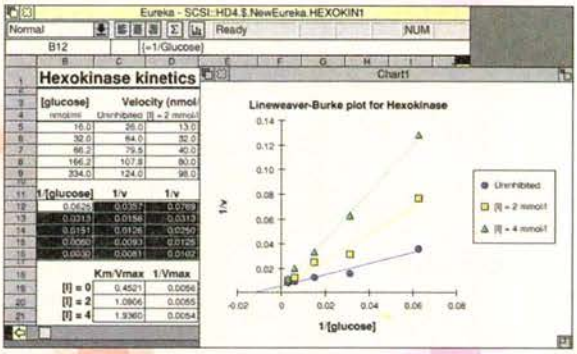
Using the Eureka style editor, you can create and apply all types of on sheet formatting and effects with the click of a mouse button.

The Data Series command allows you to automatically create a wide variety of Time, Linear and Growth series.

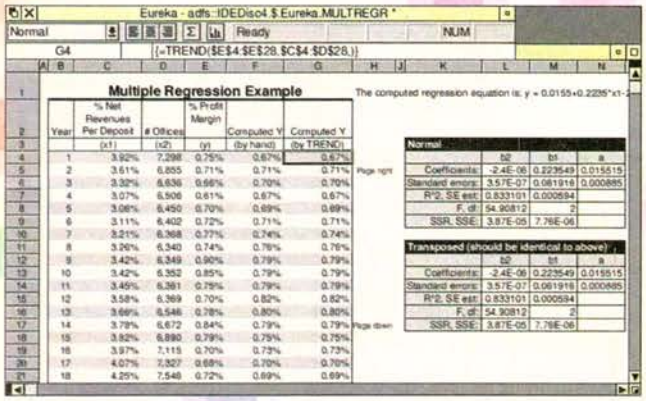


With over 155 built in functions, Eureka users have all the analytical mathematical power they will ever need, at their fingertips.

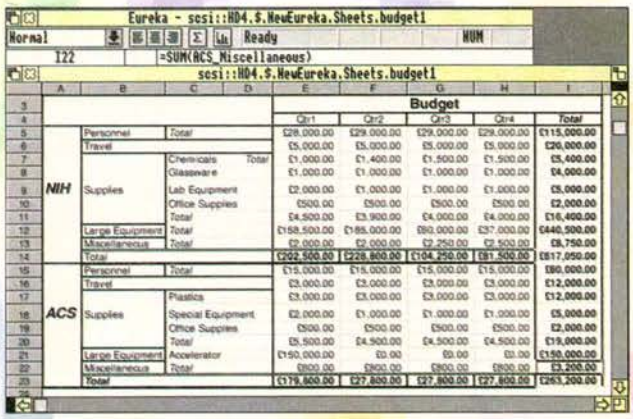
PLE WHO USINESS



Eureka offers crisp, accurate business charting in a wide variety of formats.


Eureka - adfs::IDEDisc4.$.Eureka.MULTREGR *
Multiple Regression Example
The computed regression equation is: y = 0.0155+0.2235*x1-
Normal
Transposed (should be identical to above)

Eureka's advanced statistical features make it the natural choice for scientific and engineering professionals, as well as financial analysts and business managers.



Build and maintain budgets with speed and accuracy. Using Eureka's powerful range naming features ensures you can always remember what your formulae mean, even months later!

POWERFUL, RELIABLE AND FULLY-FEATURED

Eureka brings the power and innovative features of the very latest in easy-to-use spreadsheet technology to all RISC OS users.

- Fully integrated charting and graphing, including line, scatter, bar, stacked bar, pie and area.
- Powerful worksheet formatting with styles, including cell shading, cell borders with different colours and weights.
- Picture-style number and text formatting allows full customising of value display.
- Multiple worksheets with file linking.
- Import and export of CSV and Lotus 123 formats; export of Draw format.
- Point and click formula construction.
- Linear and multiple regression analysis.

Eureka is priced at £119 + VAT.
AVAILABLE NOW for any Acorn computer running RISC OS with 2Mb of RAM or more.

Eureka contains over 150 built-in functions:

Trigonometry
PI SIN COS TAN ASIN ACOS ATAN SINH COSH TANH ASINH ACOSH ATANH RADIANS DEGREES ATAN2

Information
NA ISNA ISBLANK ISLOGICAL ISREF ISERR ISERROR ISNONTEXT ISNUMBER ISTEXT N T TYPE ERROR.TYPE

Statistical
PERMUT COMBIN SUM MAX MIN AVERAGE COUNT COUNTA AVEDEV MEDIAN MODE RANGE IQRANGE QUARTILE LARGE SMALL STDEV STDEVP VAR VARP GEOMEAN HARMEAN NRAND SLOPE INTERCEPT CORREL COVAR LINEST LOGEST TREND GROWTH

Mathematical
RAND ABS INT SIGN EXP LN LOG10 SQRT FACT FRACTION EVEN ODD LOG MOD ROUND TRUNC CEILING FLOOR RANDBETWEEN PRODUCT SUMSQ SUMX2PY2 SUMX2MY2 SUMXMY2

Matrix
TRANSPOSE MDETERM MINVERSE MMULT

Logical
FALSE TRUE IF AND OR NOT

Time
NOW TODAY DAYS360 DAY HOUR MINUTE MONTH SECOND WEEKDAY YEAR DAYS DATE TIME

String
CHAR FIXED DOLLAR CLEAN CODE LEN LOWER TRIM UPPER PROPER DATEVALUE TIMEVALUE VALUE RIGHT EXACT LEFT REPT TEXT FIND SEARCH MID REPLACE SUBSTITUTE

Financial
PV FV PMT NPER RATE IPMT PPMT VDB DB DDB SLN SYD NPV IRR MIRR

Lookup
CHOOSE INDEX HLOOKUP VLOOKUP LOOKUP MATCH

Miscellaneous
REVERSE

LONGMAN LOGOTRON

124 Cambridge Science Park
Milton Road
Cambridge CB4 4ZS
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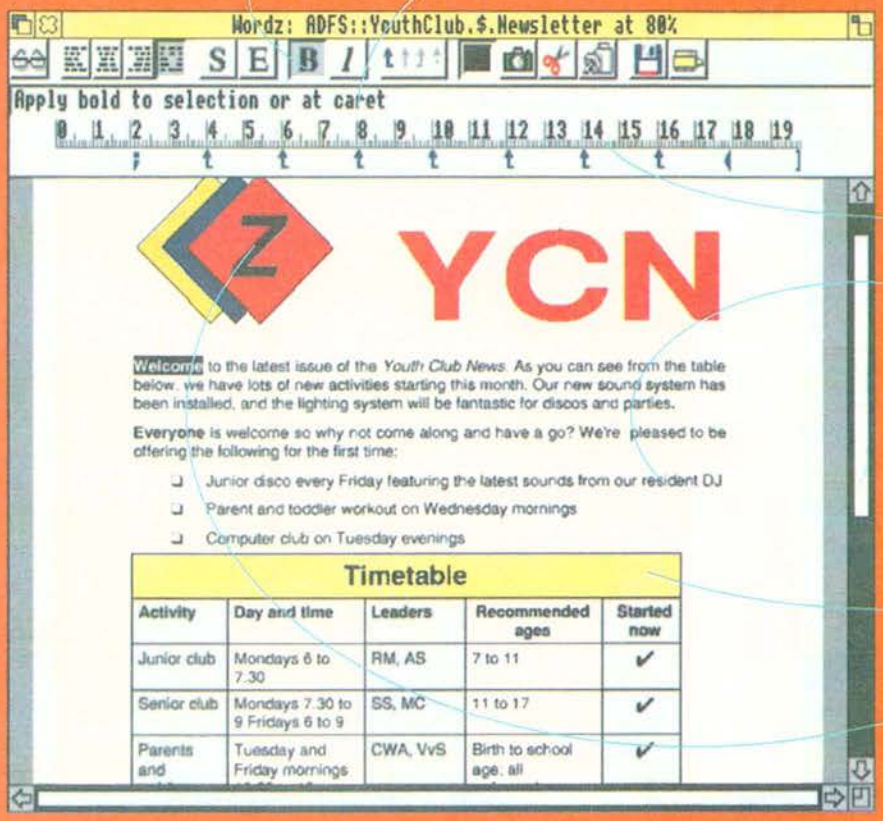
news from Colton Software


Wordz: ADFS::YouthClub.$.Newsletter at 80%
Apply bold to selection or at caret
YCN
Welcome to the latest issue of the Youth Club News. As you can see from the table below, we have lots of new activities starting this month. Our new sound system has been installed, and the lighting system will be fantastic for discos and parties.
Everyone is welcome so why not come along and have a go? We're pleased to be offering the following for the first time:
Junior disco every Friday featuring the latest sounds from our resident DJ
Parent and toddler workout on Wednesday mornings
Computer club on Tuesday evenings
Timetable
Activity | Day and time | Leaders | Recommended ages | Started now
Junior club | Mondays 6 to 7.30 | RM, AS | 7 to 11 | ✔
Senior club | Mondays 7.30 to 9 Fridays 6 to 9 | SS, MC | 11 to 17 | ✔
Parents and | Tuesday and Friday mornings | CWA, VvS | Birth to school age, all | ✔

At last, the word processor the Archimedes has been waiting for. A program that's so easy to use you'll be able to create great-looking documents the first time you use it. The facilities used most are in the *button bar*, and the *status line* gives you instant feedback. Just click and drag in the *ruler* to set margins and tabs; click on a button to cut and paste - it's that easy.

Wordz has all the features you'd expect from a state-of-the-art word processor. The powerful style editor gives you complete control over all aspects of your text; *font*, *spacing*, *margins*, and *colour*. Unparalleled control over *tables* including dragging to resize columns and rows. Speedy check-as-you-type or whole document spell checking. Import *pictures* and text from other programs, including PipeDream.

Wordz is the first of a family of programs which share the same easy user interface and include dynamic data linking. The spreadsheet Resultz will be available in mid-1993.

Wordz costs £99+VAT. *"Is it easy to use? It's falling-off-a-log easy to use."*

word"Z"! ®© ™ 1993...4...

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name

address

postcode

COLTON software

2 Signet Court, Swanns Road,

Cambridge CB5 8LA

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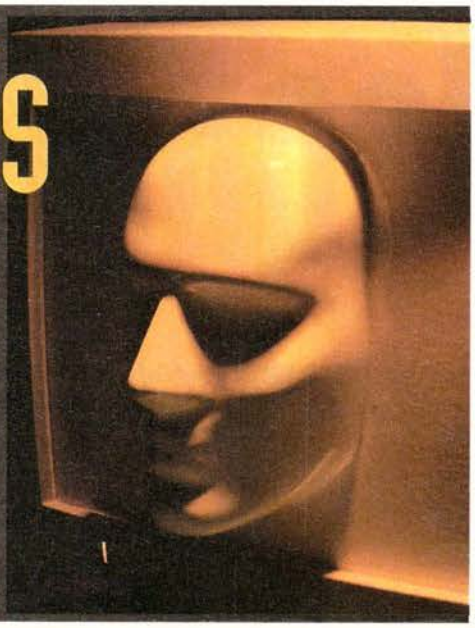
Fax 0223 312010

3-D worlds



This month we take a look at a wide selection of available CAD packages – 2-D, 3-D old and new, featuring: RiscCAD Junior, ProCAD, Perspectives, SPEX, PDT, Designer, CNC Designer and WorraCAD.

Each has its strengths and weaknesses and we reveal all – see Page 47.

Britain's best Acorn cover disk contains hours of fun and a host of useful utilities linked to our editorial features to make the magazine come alive on your desktop!

Full details about the packed MegaDisk – see page 6

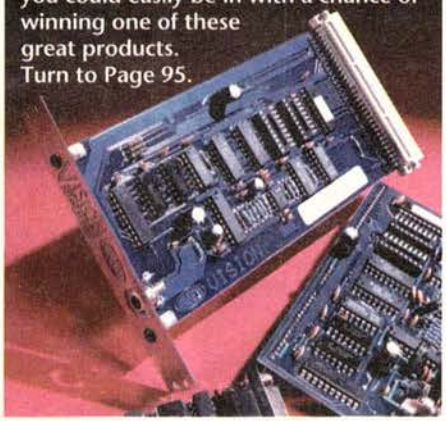
Win a dream holiday worth £3,000

Later this year an *Acorn Computing* reader could be embarking on the holiday of a lifetime.

The winner in our Dream Holiday competition will be entitled to go anywhere in the world. So if you fancy the opportunity to bask in the Bahamas or a cruise around the Caribbean, turn to Page 44.

Hardware galore!

You can win video digitisers to the value of £1,000 in our great HCCS competition. With 12 prizes to be had you could easily be in with a chance of winning one of these great products.
Turn to Page 95.



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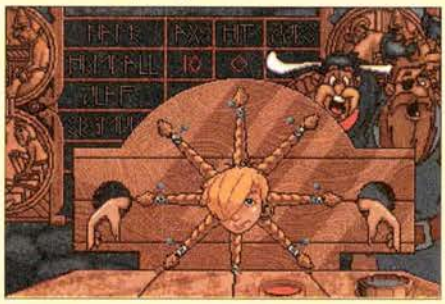
June subscription disks

This month's exclusive *Acorn Computing* subscriber-only disks feature an excellent selection of quality software.



The Archimedes disk contains:
- Heimdall demo from Krisalis
- Serenade demo from Clares
- All 8-bit listings
- Plus some of the best PD software

The BBC Micro disk contains:
- 3-D Demo program
- Save the metropolis
- Fractions to decimals
- Plus music catalogue

SUBSCRIBE NOW – SEE PAGE 19

The editorial and many of the adverts in this magazine were prepared using Impresssion and ArtWorks by Computer Concepts.

The MegaDisk

EXCLUSIVE SUBSCRIBER DISK

See pages 29 & 30

HelixBasic: Making Wimp programming easier

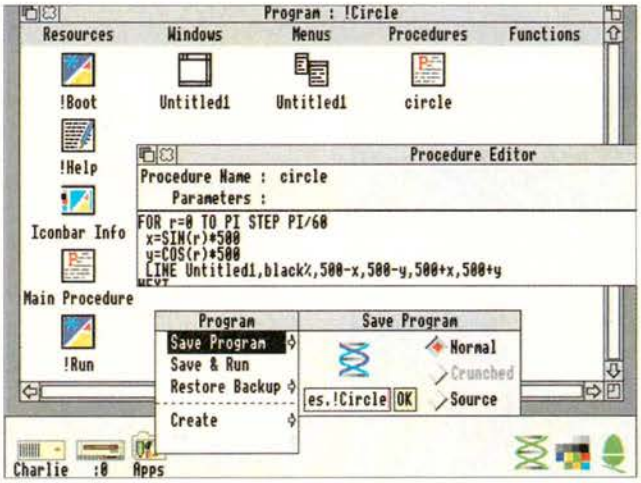
THIS full version of HelixBasic from PDK (0525 403541) has been written just for readers of *Acorn Computing* to let you experience just how easy it is to write a program in HelixBasic.

You cannot save in crunched format and it will only work up until the May 30. If you wish to upgrade to a full package the details are all supplied on the disk.

HelixBasic lets you develop significant applications, leaving the Editor to sort out the windows commands. To create a new application click on the Helix icon on the iconbar.

The essential !Run, !Boot and !Help files are created automatically with the minimum necessary contents.

For example, if you want to display a circle of lines in a window when the mouse is clicked on the iconbar, there is a program in the examples file just for you regardless of your programming skill. For people wanting to delve into programming it is a great starting point. Full help is provided within the program.



● *Leave the wimp to Helix, you concentrate on the Basic*

FAULTY DISK?

If your cover disk has a physical fault – doughnut won't rotate in the sleeve, disk errors and so on – please return it for replacement to:

Stanley Precision
Unit F
Cavendish Courtyard
Sallow Road
Weldon North
Industrial Estate
Corby
Northants NN17 1JX

If there seems to be a fault with one of the programs please contact us by post describing your machine set-up and exactly what happens when you run the program.

!AltBoot: Time saver

ONE of the most annoying thing when cataloguing disks has to be the wait. The computer goes off loading all the sprites and running the !Boot files, and you are left tapping your fingers.

Even worse than the wait is the risk of virus infection from !Boot files.

This is where AltBoot is useful. When cataloguing any disk or directory – floppy, hard, CD-Rom and so on – simply press (and keeping depressed) either Alt key. The computer will be forced not to load the !Boot files, but instead just the !Sprites file, if it exists. While this still results in a noticeable delay, it is far quicker and goes some way to prevent the spread of !Boot-infecting viruses.

Risc OS 3 users may wonder why they need to bother because they can press Ctrl instead. However, on Risc OS 3, pressing Ctrl also prevents the sprite files being loaded. I personally use the sprites rather than names to identify applications and for every application to have the default sprite is more than annoying.

Paul Mason

Getting started

THE programs on this disk are stored in a highly compressed format which sometimes enables as much as 1.6Mb of programs and data to be stored on a 800k floppy disk

The procedure for running the programs is very straightforward and does not require learning any special methods or techniques.

Switch on your Acorn micro, put the disk in the drive and click the drive icon. Now double-click !ACmenu – there's a short pause while it scans the archive then it displays a window of the contents.

You can treat this new window like any other one for viewing disk contents, you can run programs and open directories just by double-clicking them.

Large programs must be unpacked by dragging on to a separate disk before being run.

We recommend that you always read the !ReadMe files or access the help information via the Help button.

Keystroke: All at your fingertips

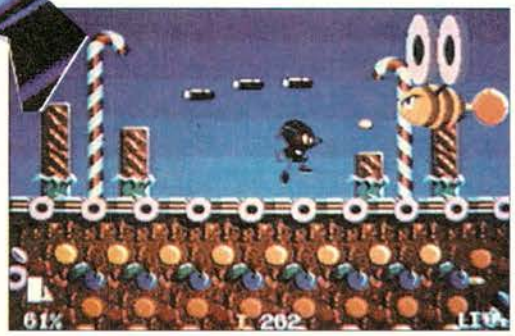
This special version from Quantum Software (0506 411162) allows you to add keyboard shortcuts to programs which don't have them naturally. So in !Paint you could add Ctrl+T to make the Paint Tools window appear. A manual is included on the disk as an !Edit file.

The full version of Keystroke costs £29.95 and comes with many keystrokes including ones for Acorn DTP, Draw, DrawPlus, Filer!, FormEd, Impression, Ovation, Paint, Revelation, Translator, Type Studio, Vector and WorraCAD. There is also a play-back only copy called !Executor.

Zool: The Ninja from the Nth dimension

YOU'VE read the review and here's a special version of the first Zool world just for you. In a land of sweets where every sugar confection has a grudge against ninjas, how can you survive?

Gremlin Graphics (0742 753423) have converted their extremely successful 16-bit hit to the Archimedes. You can use the standard x, z, ', / and Return keys or opt for the joystick if you prefer.

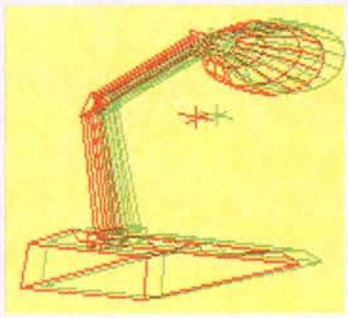


● *Hope you have a sweet tooth*

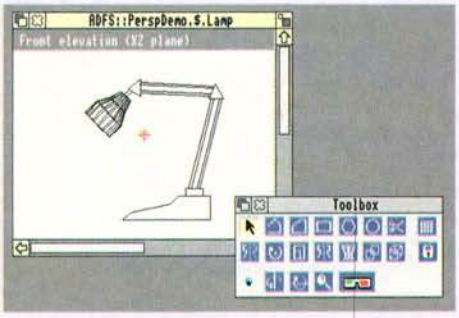
Perspectives: A different approach

This special version of Perspectives from TechSoft (0824 3318) aims to give people new to CAD packages the *feel* for this type of package.

A quick guided tour is included on the disk and you can explore three orthographic views and a pictorial one – if you click Adjust or Select on the Rotate vertical icon you can change that view too. For fans of three dimensions the Stereo view icon – red/green glasses – redraws the design in two colour separation, though this is best seen if you have a pair of 3-D glasses.



● *You can see CAD designs at any angle and in three dimensions*



● *This multi-tasking 3-D CAD package is for you to explore*

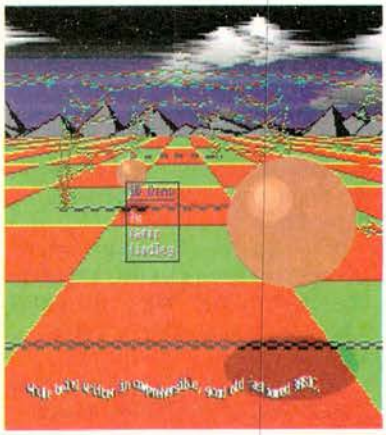
3-D Demo: Seeing is believing

HOW many of us mere mortals can understand the workings of the clever 32-bit demos which are around? Machine code is not necessary to produce impressive demos but you will need to understand Basic V to follow the listings and hopefully I can show you what your real potential is. But you can still enjoy the results if you can't program.

This program uses various simple but effective routines to produce the graphics and takes about a minute to draw them when first run. Programmers may like to examine the routines used, particularly the recursive nature of the tree drawing routine, and the controlled random element put into the drawing of the clouds.

You can look forward to realistically shaded sky, clouds, moon, spheres and ground. As well as shimmering stars, you've more control over the movement of the spheres than before, overhanging fractal trees, hills, pyramids, shadowed animated sine wave text and three very varied backdrops. So just load it up, sit back and enjoy it.

David Hindley



● *Simple yet effective routines written in Basic V*

NEXT MONTH

DataVISION: The complete program

You could buy this powerful relational database with wordprocessing, label printing, and mail-merging facilities all built in for £99.95 from Silicon Vision (081-861 2173) or you can just boot up next month's MegaDisk.

TechnoDream: Feel the force

This is Superior Software's (0652 658585) latest blockbuster by the authors of Nevryon. Level 1 will be at your disposal to let you hone your skills as you fight all that *they* can throw at you.

To make sure you don't miss out and to try your hand at winning a £3,000 holiday competition see page 44.

The MegaDisk

WANT ANOTHER DISK?

If you subscribe to *Acorn Computing* you receive a second disk each issue. This month's disk contains:

- Heimdall demo from Krisalis
- The 8-bit listings
- Serenade demo from Clares
- Plus a range of PD utilities and applications

See page 19 for further details on how to get your subscription to *Acorn Computing* and the extra disk

Identify: Reading your files

There are many sources which may produce files which are untyped – downloaded via a modem or transferred from a non-Archimedes filing system. !Identify not only works out the types of files which do not have filetypes but also manipulates the filetypes of other files.

Load the program on to the iconbar where a window gives some information about it. This window can be closed by clicking Adjust on the !Identify icon. Click Select and the main window appears, then click Menu to access a series of options.

Before you begin you must understand the following: The Currently Selected Filetype, the Input File and the Autoset state. In the main window, there is a long icon with the words Input File displaying the Input File. To make any file the input file, drag it to the iconbar icon, or anywhere in the main window – except for the filetype picture.

The name of the file will appear and its filetype will become the Currently Selected Filetype (CSF).

This will be reflected in the main window as a picture of the file and its filetype number and description will appear under the Input File. The two radio icons below toggle the AutoSet state on and off.

To change the type of a file, first make it the Input File, click Menu over the window and access the Types submenu.

You can select the CSF from here and clicking on Set will transform the Input File. If AutoSet is selected, the file's type will be set immediately.

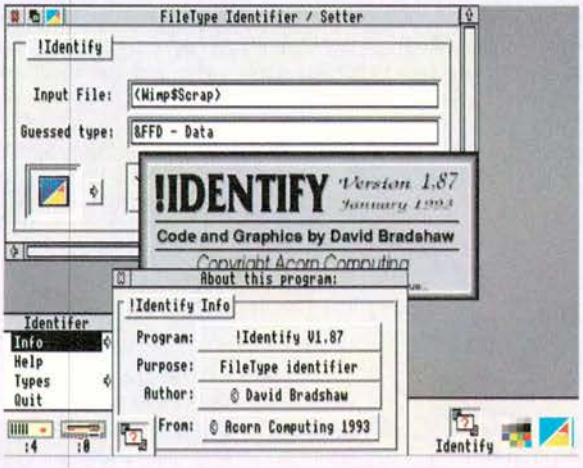
Alternatively – especially if you have a range of files – you can use the picture of the filetype in the bottom left corner of the main window. Set the CSF to the desired filetype and drag a file or selection to the picture of the filetype. The types of the files will be set immediately, and the CSF will remain unaltered.

Identifying untyped files usually starts with data being in &FFD format. If this is not the case, use !Identify to change the type to Data. Drag the file to anywhere in the main window – except the filetype picture – and the corrected filetype will become the CSF. If the filetype cannot be distinguished, it will remain as Data.

If you are happy with this, click set. To carry out this operation on a selection of files, set AutoSet on, and drag the selection.

It's worth noticing that the arrow icon to the right of the filetype picture provides a *short-cut* to the types menu. For on-screen help, click on the Help entry in the main menu.

David Bradshaw



● *Deciphering file types*

Solid dragging: Making a stimulating environment

THIS little program will liven up your desktop, or at least make saving files a bit more stimulating but will only work for those with Risc OS 3.

Now when you drag an icon from a save window your mouse pointer will be accompanied by a copy of the original icon not the boring dashed box.

Real-time dragging and scrolling of windows first appeared with Risc OS 2 back in late 1988 so it's a little odd that the dashed box is still around.

The software for dragging sprites is all in Risc OS 3 – have a look at the DragASprite module – but nothing much has been done with it, until now.

You load the program in the usual way and it only takes up about 900 bytes, sitting happily in the module area until a hard reset.

Move the pointer to the palette icon in the bottom right corner, open the save window from the menu.

Now drag the icon which appears towards the centre of the screen and you should see a second palette icon with a drop shadow. This icon will follow the pointer around until you let go of the mouse button. Unfortunately, the solid dragging effect won't work with icons in Filer windows.

If you drag a file from a Filer window the old-style dashed box will still appear.

This is because the objects in a Filer window aren't true icons as far as the window manager is concerned, so the SolidDrag program can't use the icon data to find out which sprite to use.

If you want to get rid of the program, double-click on the *NoSolid* file, or type RMKILL SOLIDDRAG at the command line.

Paul Dellar

REVIEWS INDEX

On the MegaDisk this month there's also an Edit file listing all the reviews which have appeared in ***The Micro User/ Acorn Computing*** over the years.

The most popular range of scanners

FOR THE ARCHIMEDES

SCANLIGHT 256

THE CLEAR LEADER IN SCANNING SOFTWARE FOR THE ARCHIMEDES

The ScanLight 256 scanner offers a maximum resolution of 400 dpi true 256 grey-levels at full 105mm width. In addition there is support for monochrome, 16 grey level and 256 grey-level scanning at 100, 200, 300 and 400 dpi. The latest scanner model offers a convenient one-touch scanning button and a unique overscan buzzer which gives an audio warning when you are scanning too fast. A handy ruler is also supplied to ensure perfectly straight scans. The ScanLight software offers several unique facilities that make it the leader in its field - e.g. the ability to provide all picture processing and enhancement functions with only the one original copy of the image in memory - vital since scanned pictures require a great deal of memory.

The ScanLight software offers:

- Instant image rotation by any angle.
- Support for the new RISC OS 3 true 256 grey-level sprite format.
- Only one copy of the image in memory at once.
- On the fly screen dithering for maximum image quality.
- A selection of sampling sizes from 2x2 to 8x8.
- Image enhancement facilities such as sharpening, edge detect etc.
- Simple brightness and contrast controls.
- Spline curve control over grey-map for additional control.

The perfect way to capture high quality pictures for inclusion in DTP or practically any other RISC OS application.

ScanLight 256 scanner, interface board and software £199.00 + VAT (£233.92)

Suitable for all Archimedes models and operating system version.
An internal A3000/10/20 and A4000 version is available for the same price.
Please specify when ordering.

Computer Concepts Ltd

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New Acorn Hardware

Official Acorn Publishing Dealer

A540 4Mb Ram, 120Mb HD	£1995.00
A4 4/60 Mb HD Portable c/w Acorn shoulder bag	£1699.00
A4 2 Mb FD Portable	£1399.00
A5000 / 2Mb Ram, 80Mb HD, Arm 3, Acorn Multiscan Monitor	£1399.00
A5000 / Learning Curve / 2Mb Ram as above c/w software	£1445.96
A5000 / 4Mb Ram, 120Mb HD Arm 3, Acorn Multiscan Monitor	£1599.00
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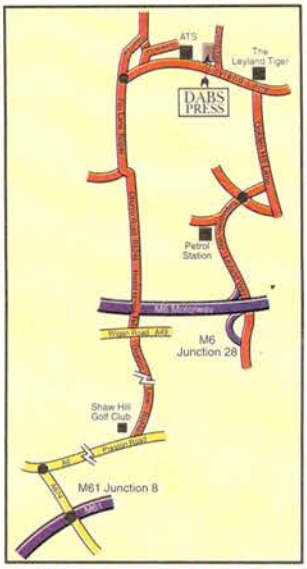

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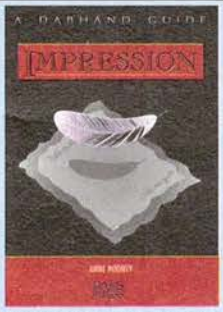

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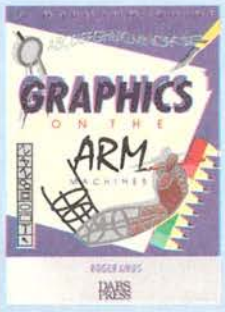

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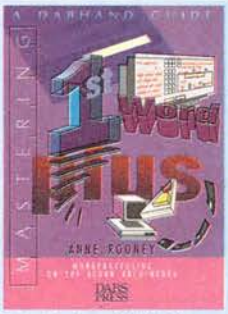

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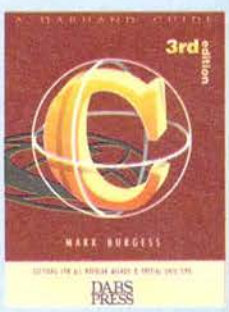

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LICENSED CREDIT BROKER

A virus a day...

This month Steve Turnbull takes a look at the world of the computer virus

WRITING a regular column in a monthly magazine is a dangerous occupation – there's the risk that you might run out of things to say. But I always trust that some little happening will spark off a new train of thought.

And so it was when in the morning post I received a carefully packaged pair of disks, with no accompanying note. The arrival of such a thing always puts me on my guard and what was written on the label sent alarm bells ringing:

One had *KeyWord – has worked once* and the other had *Speller – has worked once* both hastily scribbled in pencil. Why should such a thing set off the klaxons? Programs seldom work just once and especially not these.

Failure to work at all I can accept. Errors, problems, lack of memory, accidentally deleted files, all these are acceptable as reasons for people failing to get programs to work at all ... but *has worked once*? No, not acceptable.

With all theses alarms going off in my head I loaded up !Killer, !ArcFS (in case of archives) popped the disk in the drive and instructed !Killer to check for viruses. And bingo, both applications were thoroughly infected with both the Icon and Module viruses – no wonder they didn't work.

Our next step at this point is usually to write to the owners of the infected machine and tell them the sad news while recommending they get a decent virus killer. Unfortunately the owners in this case had failed to put their name and address anywhere, so I reformatted the disks and put them in my pile of spares.

Dealing with computer viruses is a very simple matter and the two-part *Killer* from Acorn – via Pineapple Software – is certainly the best software for the job. But it's all too easy to get your machine cleaned up once and then forget about it. Virus protection is a continuing task.

Complete paranoia is not really the answer and anyone who does a switch-on reset after running any and every program is wasting time and energy. Caution is the watchword.

As a simple rule as long as you check each new disk when it first arrives, from whatever source, you don't need to worry about the rest of your system.

Our cover and subscription disks are checked for known viruses before and after mastering, and we receive regular updates of the !Killer program so we always have the latest version. The prospect of releasing a virus on to the Acorn public is enough to make a magazine editor justifiably paranoid.

I've spoken to three people who've written viruses: Two strains were created purely as programming exercises and never released – the *because it was there* syndrome as applied to programmers.

The third took the form of a strange phone call: Our receptionist told me the caller wouldn't give his name and was very rude.

I took the call out of curiosity and found myself at the receiving end of a tirade about how wonderful the Amiga was and how dare I criticise it.

The caller had, he said, written one of the more vicious of the viruses on the Acorn machines and was, apparently, trying to get his revenge on Acorn for some reason. Producing a better machine than Commodore perhaps? I'm not sure.

It did tend to confirm my view that authors of damaging viruses are a couple of directories short of a full path name. He still wouldn't give me his name so I hung up on him. A curious event in a curious world.

RICKY DELARRE

It was with great sadness that I learned of the death of Ricky Delarre. Most of you won't know the name but his work has included the 3D space game Karma, the new Clares program Topographer and, for *Acorn Computing*, he was HacMan 2.

Over the last year both Pam and I had come to know Ricky as a knowledgeable, friendly and humorous colleague.

We'll miss him.

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– as above + MEMC1a £124
– as above + MEMC1a + fitting £154

ICS

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– as above + fitting £210
A5000 2-4 Mb Non-upgradable† Atomwide £85
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A310 RISC OS Carrier Board ‡ IFEL £21
A5000 Fitting Kit for second hard disc ICS £15
Arckey Function KeyStrip Holder ICS V0 £3
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ArcNET ACS £69
ARM3 ‡ Aleph One/IFEL £175
ColourBurst State £322•

ColourCard CC £225

– A3000 External CC £225
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For ordering details please turn to page 3

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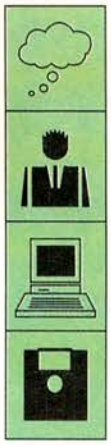

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All the fun of the fair

LINDIS (0986 85476) are holding their Computer Carnival at the County InSET Centre, Witard Road in Norwich on June 11 and 12. The Friday will be devoted to teachers while the Saturday will be more of a family day out.

Bouncy castles, a games arcade and over 45 exhibitors of software and hardware will be there as well as the editorial team from *Acorn Computing*. The fun starts at 10am.

New Sams

SUPERIOR (0652 658585) are still producing software for their loyal BBC and Master following and next of the production line will be Sam 18. This successful compilation series now presents you with Holed Out, Nevyron, E-Type and Citadel 2 and will be available from retailers in the summer.

Musical Dudley

FOR nearly eight years Dudley College have been running an educational viewdata system providing free teaching material during the day, and home users with the Hybrid Music System have had access to Ample DCT.

Now all their music files are being gathered into one large music library. To download files call the DCT Database via Prestel on 0384 239944 or 0384 238073 on a 1200/75 baud rate.

Budget power

DIGITAL Phenomena probably known best for their PD virus killer Guardian, are about to launch a professional version called GuardPRO for £9.95 which comes with a series of disk utilities in addition to its powerful virus detection abilities.

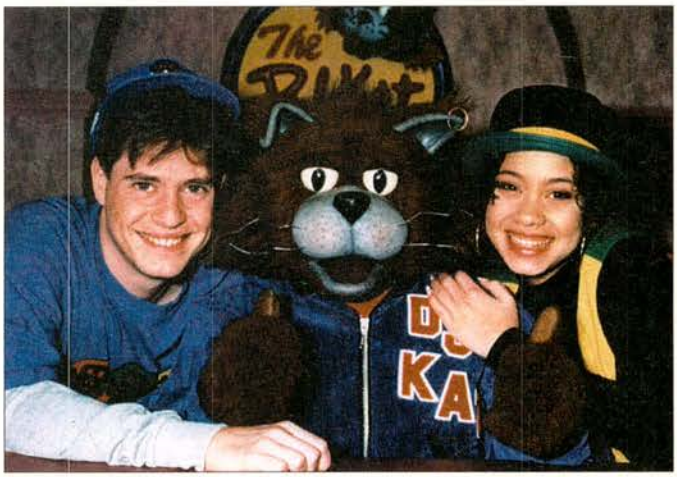
Digital have also been developing a new range of budget games with a price tag of £4.99. So watch this space for more details on SuperSnake, RuneSeeker and many more or contact Digital Phenomena at 104 Manners Road, Southsea, Hampshire PO4 0BG.

Sky's the limit or is it?

THE Acorn/Tesco promotion has reached the stars – well satellite TV – with a link with the DJ Kat Show on Sky One. Throughout Easter week they ran a competition challenging viewers to design a meal for the intrepid DJ and presenters Marcelle and Simon.

This can be a painting, collage or model and the closing date is May 26.

The prize winning school will join the satellite as a celebrity sports star clamours around a booth collecting as many Tesco vouchers as he can. Who will be the winners, and who is the star? Tune in on June 8.



● *DJ Kat is pictured with presenters Simon and Marcelle*

Welsh score a hat trick

STAYING with the small screen you'll find Risc OS machines being used on the live TV programme Te yn y Twlc. Called Soch Soch this is a simple 40-second game played by children phoning in.

It is based around a pig who has four troughs to feed from and players win prizes depending on their performance. The game is played using an A420/1 with graphics generated by the Milliped Prisma 3 system and digitised graphics coloured using Now Motion's (0222 453933) !PPaint. Scores, tables and credits were created using Now Motion's text handling libraries.

Still on the phone, Ar dy Feic – Welsh for On yer Bike – is a phone-in TV Video game played by two children – one on the Slot Sadwrn set on a static bike and blindfolded and the other on the end of a phone ready to give directions.

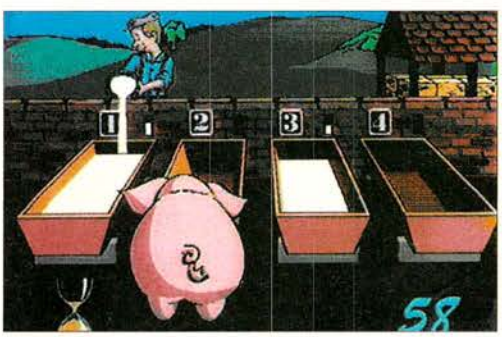
The game is generated on an Archimedes with the speed of the bike linked to the hardware scrolling of the Prisma using a piece of interrupt-driven Arm code. Finally Pendro is a quiz series for under 16s with the computer elements coming from two A440s with a Millipede Prisma 3 card.

One computer plays the games: Triangle game, reaction speed test, memory game and logic reasoning. All use a touch screen and the questions and game setups were created within the Risc OS desktop.

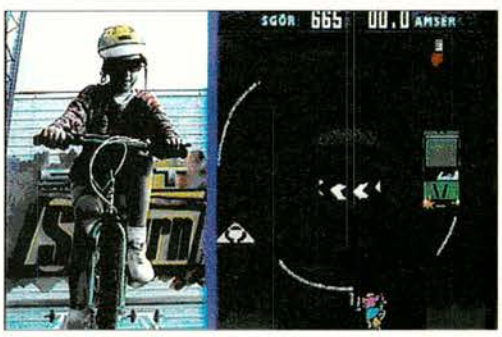
This machine also uses Superior Software's !Speech system to speak the contestant's names – although some Welsh names are out of the range of English phonemes.

The second machine was really a slave providing a complete game status display for the presenter and data on scores and who buzzed first.

Feedback from the contestants' buttons came from a Midi-based encoder box feeding into an Acorn Midi expansion card with the desk lights controlled via an interface based around the I^2C bus.



● *You'll find an Archimedes system behind Soch Soch*



● *Ar dy Feic – pedalling for success*

The New Generation!

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RISC User, the highly popular magazine for Archimedes, is bigger and better. The new RISC User is now B5 size, offering a sophisticated design, bigger colour illustrations and bigger pages with more information. Altogether better value and no increase in price.

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The RISC User magazine disc is widely acknowledged to be the best magazine disc for Acorn computers. Each disc is filled with original software of the highest quality, fully tested and supported by our own staff plus all the programs from the magazine and other items from within the magazine pages.

A fitting tribute

DUE to the tragic death of Ricky Delarre, Clares (0606 48511) have delayed the release of Topographer. The Clares team found working with Ricky a very rewarding experience – he was a very professional programmer who took a pride in his work.

Topographer was literally hours away from being finished and it is reflection of Ricky's popularity that his colleague, Ian Robinson, has stepped in to complete the program.

Managing Director, Dave Clare commented: "Ricky will be missed by all at Clares and his death is a great loss to everyone in the Acorn world as well as to his family and wife, Jayne."

The machine behind the mask

WHETHER you are in education or a home user, there are times when you could do with excluding tiny fingers from leafing through your hard disk. Iron Mask 2 from Turing Tools (0865 775059) have developed a security system with this in mind.

By supporting 63 PIN identified users and an administrative *superuser* who is responsible for adding and deleting other users, IronMask lets people password control files and directories. Automatic time-out guards an unattended IronMask session from the opportunistic delver.

Furthermore files can be *frozen* against deletion and write-protected so it is impossible to regain deleted or write access bites within the directory until it is *thawed* by the *superuser*.

IronMask 2 costs £65 and is the multi-user version of IronMask 1.2 – Personal Edition – which now retails for £49. If you want to upgrade to IronMask 2 it will cost you £10.

Birthday games

COIN-AGE (0282 962688) are celebrating their first year of publishing and from now until June 10 if you buy Paradroid 2000 from them direct you get a copy of Gribbly's Day Out – totally free.

Plus, every name will go into a draw to win a lifetime supply of Coin-Age games to be drawn on July 31.

Extra, extra: Read all about it

A SERIES of *newsdays* have been running in Cleveland organised by the Educational Computing Centre (0642 325417). These allow children from secondary, primary and special schools to produce a school newspaper using their 8 and 32-bit computers.

They are aimed primarily at children with literacy problems who are given a day to get their work to press. Each school uses faxes, wordprocessors and DTP packages combining news, horoscopes, jokes, weather reports as well as interviews.

CECC with helpers from a local sixth form college coordinate the stories and fax and E-mail them to the schools, with additional help coming from a local newspaper, *The Hartlepool Mail*, who provided up-to-the-minute news and new slants to stories the pupils had.

The schools used a mixture of software – Phases, My World and Folio – on A3000s and Master 128s. Illustrations came from clip art and one school even used an Canon Ion camera.

There are six newsdays planned for 1993 with one English and one Modern Languages day each term with one of the newsdays in the year, sponsored by the *Times Educational Supplement*, run as a competition.

Primary networks

ST JOHNS Infant School in Fareham, Hampshire has 220 children in nine classes each class having a 2Mb A3000 and making it probably the first specifically infant school to install a cross-site Acorn network using a 2Mb A410/1 as fileserver.

The children, aged between 5 and 7, took to the network immediately choosing programs from Digital Services' friendly !Waiter. The County Systems Support and Development Consultant, Steve Holroyd commented: "In this school, as in so many other primary schools in Hampshire, young children use high specification computer systems with a confidence that can only breed optimism for the future."

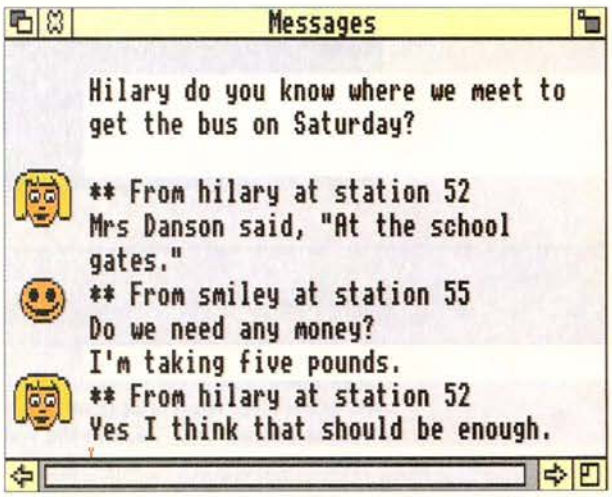
Talking to your peers

NETCHAT is a network communication system allowing peer-to-peer networking on Risc OS systems.

The main NetChat module allows people to communicate via a conferencing system. Messages can be typed into a conversation window or text files can be dragged on to the NetChat icon. Other files can be dragged between machines without the need of a fileserver.

NetChat comes with a number of extensions including an OS utility which allows operating system commands to be sent to a remote machine permitting modules and programs to be run on one machine from another.

Eyeball allows one station to take a snapshot of the screen from another computer and real-time interactive computing is provided by a game of Othello across the network. NetChat comes from XOB (0307 84364) and costs £84.


Messages
Hilary do you know where we meet to get the bus on Saturday?
** From hilary at station 52
Mrs Danson said, "At the school gates."
** From smiley at station 55
Do we need any money?
I'm taking five pounds.
** From hilary at station 52
Yes I think that should be enough.

● *NetChat allows you to converse without the need for a file server*

Diary Dates

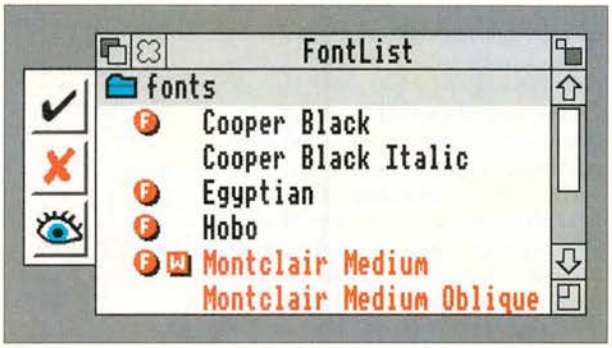
Second National Special Educational Needs Conference
5-6 May. Avant Hotel, Oldham. Cost: £150 (£100 non-residential).
Contact: NW Semerc (061-627 4469)

Computer Shopper Show
20-23 May. National Hall, Olympia, London
Contact: Blenheim (081-742 2828)

Lindis Computer Carnival
11-12 June. County InSET Centre, Witard Road, Norwich
Contact: Lindis (0986 85460)

Font finder general

● *Easy access to your fonts*



AFTER a while taking a look in your font directory can be a frightening exercise, but Look Systems (0603 764114) have come up with a rescue package, Font Directory. This fully-fledged Risc OS filing system has been developed specifically for outline fonts.

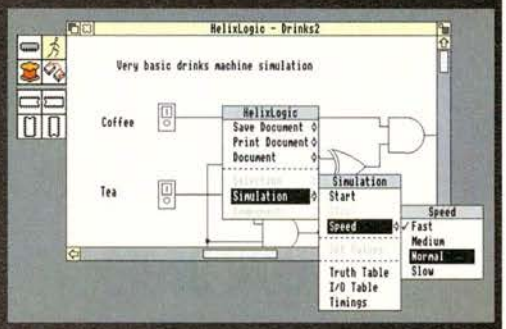
Once installed, fonts are displayed in a window and can then be selected individually, by weight, family and so on. You can define your own fontlists for certain applications and opt for a default which boots up with your machine.

Using Font Directory you can view your fonts and even create extendable font partitions.

This package costs £35 – the network version costs £250 – and is available to Risc OS 2 and 3 owners.

A logical progression

PDK Technologies (0525 403541) have just released HelixLogic to provide an editing environment for a layout of electronic logic gates. In addition to designing, HelixLogic can also simulate the design with the ability to change the input states to view the resulting changes.



● *HelixLogic lets you design, edit and view electronic logic gates*

Layouts can be saved as drawfiles, automatically generate a truth table and display changes in a timing diagram. There is also a facility to display the current inputs as output states in a different window in True/False form as opposed to 0/1. Various gates are provided including all the standard two input logic devices including oscillators, counters and frequency dividers and all for £24.95.

STOP PRESS: Goodbye Mr Chips

ACORN have announced that they are to cease manufacturing the BBC Master 128. This ends their 11-year affair with the 8-bit BBC Micro.

However, a further 2,000 units are to be built in order to maintain supply throughout the summer and Acorn confirm that they will continue to provide spare parts for a minimum of five years as well as fulfil orders for peripheral software and hardware for as long as stocks last.

Marketing director, Mike O'Riordan explained that the decision was taken after considering a number of factors, not least of which is the general move away from 8-bit technology to 32-bit platforms found in 80 per cent of educational establishments in the UK.

Helpful wimps

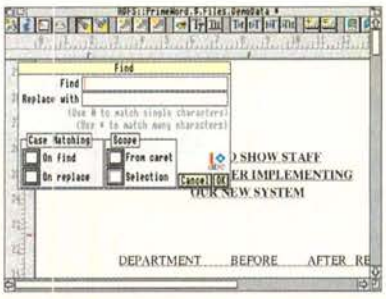
WIMP Programming For All by Calcraft and Wrigley is now available in a new revised edition for the same price of £12.95 from Risc Developments (0727 40303) while for an additional £4.95 you can get a disk containing the complete set of example programs referred to in the book.

The revised edition and disk contain some additional material specific to Risc OS 3.1 while the core of the text remains unchanged.

ACORN USER SHOW REPORT

OVER three days in North Yorkshire, it was proved yet again that there is life north of Watford Gap. This was the first major Acorn show for four years to be held outside of London and proved to be very popular with everyone.

If you missed it, here are some of the products launched at the show.



● *PrimeWord is a simple to use wordprocessor with a host of features*

Following the success of PrimeArt, Minerva have expanded the range to include **PrimeWord** – a wordprocessor designed to be configurable to individual users with a wide range of ability. Documents utilise the Acorn outline font system for flexibility and you can incorporate sprite and drawfiles into your work too.

You can work on different PrimeWord documents at once as well as several views of each document. This simplifies cross-referencing and moving words from one document to another.

The interface is designed to be intuitive with frequently used features accessible from a *button bar*.

PrimeWord also comes with a spelling checker of over 50,000 words. The next release in the series is **PrimeMover**, a powerful but easy-to-use animation package for £79.95.

But it's more than a sequencer as you can create animations in real-time specifying the time events will occur.

Pendown has been a popular wordprocessor in schools for sometime, and Longman Logotron (0223 425558) announced an enhancement with the launch of **Talking Pendown**.

As well as the usual features Pendown now speaks letters, words and sentences as well as the paragraphs and partial or complete documents.

Talking Pendown works on the full 32-bit range and no additional hardware ➤

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A3000 Series ICS 120Mb IDE Hard Card	£424.00
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A3020/A4 Conner 120Mb 2.5" Internal IDE Hard Drive	£317.00
Aleph One PC 386 Card with 1Mb RAM	£375.00
Aleph One PC 486 Card with 4Mb RAM	£569.00
Second Hard Drive Fitting Kit (Suitable for A5000/300/400/500)	£19.95
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HelixBasic

HelixBasic is a language which performs all the 'house keeping' tasks of the RISC-OS environment (leaving you free to concentrate on the functionality of the program) and provides many new features.

A versatile program editor allows the easy creation of windows and menus with the linking of different sections to normal BASIC code.

- ✔ *Easy and intuitive program development*
- *Transparent interface to RISC OS*
- ✔ *Provides control of text, graphics, sound and animations*
- ✔ *Unlimited length strings*
- ✔ *Advanced data structures*
- ✔ *Fast and efficient operation*
- ✔ *Fully RISC OS compliant*

Amazing Maths

This easy to use program is competitive and fun to play. You must complete the maze by searching levels and answering maths questions along the way. The question difficulty can be altered to suit individual needs.

Concept Keyboard ✔
Number Bonding ✔
Multiplication & Division ✔
Addition & Subtraction ✔

Amazing Maths is a joint development between Cambridgeshire Software House and PDK Technologies.

£99.95

PDK Technologies, 4 Meadow Way, Ampthill, Bedfordshire, MK45 2QX
Telephone : (0525) 403541

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➤

is needed. The cost is £64 or you can upgrade for £32.

If you want to add a thesaurus to your work, Computer Concepts' (0442 63933) **WordWorks** is a little nearer completion and an early version was on display.

Dabhand Computing (061-766 8423) released what they call *the ultimate hard disk backup program.* Called **Archimedes Visual Backup** it retails for £49.95 (inc VAT) and is determined to make the process of backing up your disks as interactive and easy as possible.

Most of the operations are based around a tree viewer of your hard disk where you can specify which items you can and you can backup or restore and includes options to compress files, back up partitions, operate in background mode – even specifying the amount of CPU time Retrieve will use.

Almanac from Stallion (0225 339090) was on sale for the first time with the manual as part of a specially designed leather FiloFax. They also had the latest version of **StrongED** which proved to be very popular with programmers wanting multiple language support and multiple throwback windows.

You can also use StrongEd for basic wordprocessing as it supports automatic word wrapping and you can configure the width of the window.

For people impressed by Acorn Replay movies and with the urge to develop their own comes **Empire** from Uniqueway (0222 644611). This works in conjunction with Irlam Instrument's Replay DIY Card and other video capture cards supporting ViA format. However, you will need Risc OS 3.1.

Movies are created and edited in film strip style, enabling an accurate choice of edit points for audio and video. ViA format movies are 15-bit per pixel video and 8-bit linear per sample stereo audio.

Video clips can be assembled, trimmed and altered to give slow motion effects, while the audio section features fades and level balancing as well as editing.

An A5000 or A520 with 4Mb ram and an 80Mb hard disk plus a multiscan monitor are recommended as is a back-up device along the lines of a Floptical or 128Mb magneto-optical disk. If you need to put your films on to floppies, Uniqueway provide two applications – Splitter and Re-Joiner – so you can split your movies across a number of disks.

For younger children – aged between three and seven – 10 out of 10 (0742 780370) have released **Early Essentials** with Junior Essentials planned for later in the year.

Early Essentials comprises six games: Gnasher, Link Up, Artist, Grab It, Stones and Racer. They provide fun ways to enhance a variety of skills from matching shape and colour, to alphabet work, logic and time.

As with the other programs in the series the parent/teacher can customise the game for the individual child and all the games are graded according to subject and at later levels for Key Stage 1 areas of the National Curriculum.

An achievement record is kept for each child so you can see progress, with certificates being awarded for the child to print and keep.

On the entertainment front **Zool** from Gremlin proved to be very popular while the latest games from Software 42 (0702 230469) – **Cycloids** and **F.R.E.D.** – and TBA's (0970 626785) **Axis** were good crowd pullers.

Also for pre-school children – and fans of Big Ears and Toy Town – The Jumping Bean Company (0602 792838) are now nearing completion of the 32-bit version of **Noddy's Playtime**.

On the hardware side Simtec (0772 812863) were demonstrating their range of upgrades, and their new **Turbo Cards** which aim to increase your machine's speed by over 41 per cent and give you 4Mb of ram.

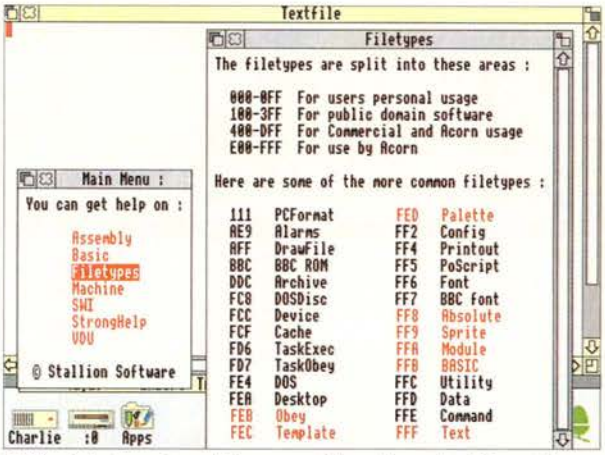
HCCS (091-487 0760) were exhibiting the latest in the **Ultimate** range while SJ Research (0223 416715) had **Nexus Junior** which allows three 32-bit machines to be networked, sharing a hard disk and a printer from a fourth machine. It is aimed principally at primary schools.

Ethernet networking

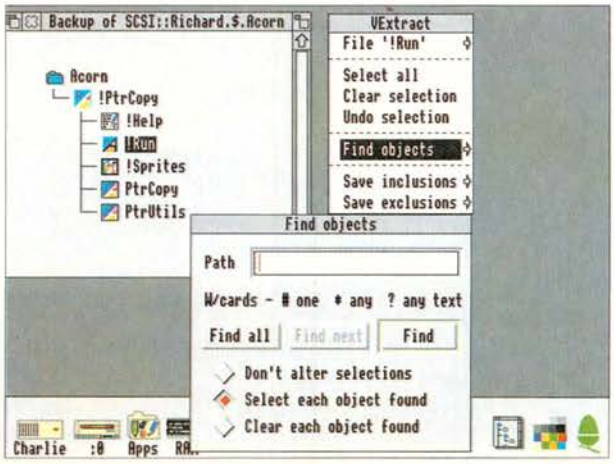
Risc Developments (0727 840303) were playing their cards right at the show for anyone interested in networks. As reported last month, Risc have launched an expansion card for the A3000 and A4000 which provides a user port, analogue converter and optional Econet interface on one board. This will allow both Econet and Ethernet interfaces to be fitted to an A3020 or A4000 turning the computer into an AUN gateway station.

In addition, they have produced a range of Ethernet interfaces for all 32-bit machines – apart from the A4. When you use it with the AUN software you have a network running faster than Econet while retaining Econet compatibility.

All the cards are ideal for the standard Ethernet cabling while the A5000 card has a 10Base5 AUI socket allowing connection to the thick-wire networks most commonly found in universities. This means that using proprietary software and Acorn's TCP/IP suite, the cards can talk to Unix machines, for instance.



● *The latest version of the powerful and popular StrongED*



● *Visual Backup uses the tree viewer to specify your backup procedure*

● *F.R.E.D. is the latest game from the Software 42 stable*

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ACORN A3000, A3010, A3020, A4000, A5000 & ARCHIMEDES

TECHNODREAM

At last, the action-packed sequel which everyone has been waiting for! Now, in addition to a 1 player option, you can choose to have 2 players simultaneously. Now, in addition to horizontal parallax scrolling, there is vertical scrolling to give a much enlarged playing area.

There are 18 increasingly fiendish stages, with brilliant arcade-quality graphics and massive animated sprites, plus digitised sound effects and 6 atmospheric pieces of stereo music. Control by keyboard or joysticks (Acorn A3010 or RTFM).

"Technodream's action gets so fast and furious the screen looks like an abstract painting. A highly polished product and well worth the asking price of £25."
...BBC Acorn User (May 93)

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Four of the most popular strategy games ever produced for Acorn computers in one great value-for-money package. **Repton 3, Around The World In 40 Screens, The Life Of Repton** and **Repton Thru Time** – with choice of four tunes and a position Save/Recall facility, plus easy-to-use screen and character design and editing facilities.

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David Braben, co-author of ELITE, has harnessed the speed and performance of the ARCHIMEDES to create a programming masterpiece. You control a hoverplane, equipped with a laser cannon, smart bombs and homing missiles, over a massive 3-dimensional landscape, with realistic area shading and accurate perspectives.

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In this unique game, you can swap between air and ground/sea forces as the battle develops. Practise with the biplanes and tanks of 1918 Europe, the fighters and gunboats of the Pacific 1944, and the guided missile jets and desert tanks of the Gulf 1991. Then to 2150 and the final challenge!

"The sense of speed when flying around is excellent. Skimming along the ground in a stealth fighter is particularly fun."
...BBC Acorn User (Dec. 91)

"The ultimate dogfighting game - will take weeks of intensive play to complete - sinks its hooks into you and doesn't let go."
...Archimedes World (Dec. 91)

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Give your computer a voice with this high quality speech synthesiser, which is both easy to use and very flexible. It can directly speak words you input or text files, or you can use phonetic input to add stress/intonation, speak foreign languages or even sing! An easily modified spelling program is included.

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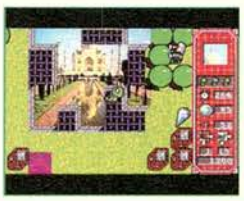

EGO: REPTON 4

Ego, the wisest of all the Repton family, now presents the cleverest and most puzzling of all the Repton games. There are a massive thirty levels of play. In each level you have to build up a jigsaw puzzle of a famous personality or place by collecting the pieces scattered around.

However, it's not quite that easy! You have to carefully manoeuvre your way around using various Conveyers and Transporters, and a lot of cunning strategy. You collect the Gems as you move around, whilst dodging the deadly Androids, but what do you do with the Towers, Trees, Grass, Mushrooms and Holes?

"Repton 4 is challenging, good value for money and well graded. What more can I say?"
...Acorn Computing (Jan. 93)

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SUPERIOR GOLF

The complete golfing game for 1 to 4 players, designed exclusively for the ARCHIMEDES. Realistic gameplay with a choice of six courses (St Andrews, The Belfry, Victoria and three Sea Palms courses), plus Driving Range and Practice Green. Full feature hole and course design and editing facilities.

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THE LAST NINJA

You must use swords, nunchakus and shiraken stars and solve many devious puzzles in over 140 action-packed screens. From the dangerous wastelands and magnificent gardens, to the direst dungeons and the final confrontation in the Inner Sanctum of the Shogun's palace.
You cannot fail...you are The Last Ninja.

A graphically brilliant conversion, using the full screen and 256 colours, of one of the most popular and highly rated games ever produced for home computers.

"There's a great big nasty at the end of each level. The solution is never a matter of fighting, it always requires some astute thinking. The Last Ninja is a great game – go silently and leave no witnesses."
...Micro User (Aug. 92)

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Defend: Save the metropolis

It is the year 2074 and the world is an exceptionally peaceful place. Only a small minority have living memory of war and few weapons remain. So far, space exploration for alien life has been fruitless.

However, they have now arrived undetected at Earth's door. But their objective seems to be the utter destruction of the planet surface and the life it contains.

As one of the last remaining people trained in military procedures you have been chosen as the sole planetary defender until the aged automatic weaponry can be restored to operational status.

Your mission is to protect the skyscrapers below from certain destruction for as long as possible. This will enable the population to flee to safety bunkers with as many possessions as they can.

At your disposal are just three defence craft: Old and vulnerable, but fortunately equipped with powerful laser pulse weapons which themselves have an infinite operational life.

Your craft hover a little way above the metropolis – they are incapable of flying at a particularly high altitude. They can be destroyed in two ways: The first is by a direct collision with a falling bomb.

The other is from the after-effects of a bomb hitting the ground itself: Electrical generators are exposed when the tower blocks above are destroyed, and when hit they explode causing erratic magnetic fields. These make the lasers in your craft engage an instant self-destruct.

A pause facility is available should you be interrupted halfway through a seemingly successful mission – just tap the spacebar to engage it, and again to disengage.

Additionally, should the sounds become irritating to you or others, hit S during your game to disable them – Q can be used to reinstate them.

Should you find the game too speedy for your liking *LOAD* the program into memory and change line 400 to:

```
400 flag2%=(flag2%+1) MOD 3
```

SAVE the amended program to another disk so as not to lose the original.

Also, if you wish to change the number of available craft just alter the variable *craft%* in line 500 appropriately.

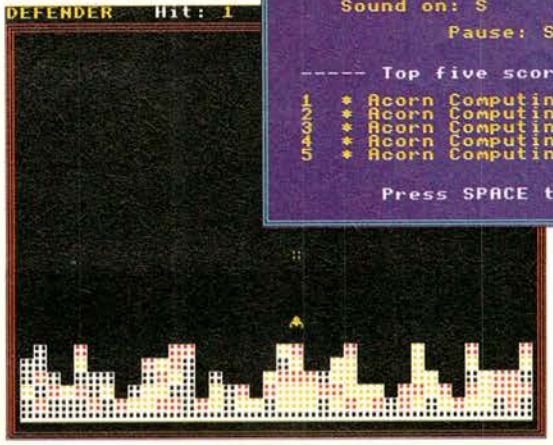
Finally, may I wish you the best of luck with your mission – you'll need it.

Stephen Wade

Control	Action
Z	Move left
X	Move right
Return	Fire lasers
Q	Sound off
S	Sound on
Space	Pause/Continue

**** DEFENDER ***** by Stephen Wade ****
Your mission is to save the metropolis from an aerial onslaught. You have been equipped with three defence craft which hover above the skyscrapers. A craft is lost either when directly hit by a falling bomb or when a bomb explodes on the ground.
Controls
Left: Z Right: X Fire: Return
Sound on: S Sound off: Q
Pause: Space
Top five scores today:
1 * Acorn Computing * 0
2 * Acorn Computing * 0
3 * Acorn Computing * 0
4 * Acorn Computing * 0
5 * Acorn Computing * 0
Press SPACE to play...

● *Can you find a place on the high score table?*



● *The lone defender of life as we know it*

Acorn COMPUTING

Don't miss out on the great programs for the Acorn 8-bit machines that you can receive every month. From listings written specially for *Acorn Computing* readers to an excellent selection of PD programs.

Subscribe now, turn to Page 19

Musical impression exclusive

There's now an on-line Music Library for BBC Micro users who also have a Hybrid Music 5000 sound system. Dudley College in the West Midlands have put half of their entire collection – published over six years – on to the DCT Database available by modem.

Set your computer to handle Prestel 1200/75 and dial either 0384 239944 or 0384 238073 – both lines operate 24 hours a day.

On this month's 5.25in subscription disk you'll find the catalogue of what's available on the Dudley College system plus two Ample tunes to show the quality that's available.

3D Demo: Seeing is believing

If you are fascinated by the demos around for the Acorn machines, don't put these all down to programming in machine code. You can produce some very impressive ones in Basic. You can follow my listings and hopefully I can show you what your real potential is. If programming is not your forte, sit back and enjoy the show.

The program uses various simple but effective routines to produce the graphics and takes about a minute to draw them when first run.

Programmers may like to examine the routines used, particularly the recursive nature of the tree drawing routine, and the controlled random element put into the drawing of the clouds.

To whet your appetite you can look forward to realistically shaded sky, clouds, moon, spheres and ground. As well as shimmering stars, you've more control over the movement of the spheres than ever before, overhanging fractal trees, hills, pyramids, shadowed animated sine wave text and three very varied backdrops. So just load it up off the disk, sit back and enjoy

David Hindley

● *The moon, sky, clouds and fractal trees are all yours*

CrowGo: Workers' playtime

If you fancy a touch of rhythm and blues this musical animation from the multi-talented Mike Goldberg is just for you. You could even join in with the *cool dudes* if you think you can stand the pace.

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If there seems to be a fault with one of the programs please contact us at the magazine by post describing your machine set-up and exactly what happens when you run the problem program.

Fractions to decimals: For those with a mathematical bent

Of course it is easy for the micro to change fractions to decimals provided you are happy with a nine figure answer. However, sometimes you need more accuracy and that's what you've got here in four compact programs – FrDecimals, FrDecDouble Height, FrDecLoop and FrDecDLoop.

In the first of these you can specify virtually any number of figures after the decimal point. The second program produces double height figures with a space between them, so you are limited to 18 figures and an accuracy of 17 decimal places.

Should you want all possible fractions of a given denominator, try the third and fourth programs for single and double height figures. With either of these you can explore recurring decimals and see some very interesting number patterns.

For example, the 12 fractions whose denominator is 13 all give six figure recurring groups which can de divided into two groups of six.

Other prime number denominators hold surprises too.

Jon Millington

```
Enter numerator 57
And denominator 234
Dec. places? (18max) 18
 0.243589743589743589
Enter numerator 22
And denominator 7
Dec. places? (18max) 18
 0.142857142857142857
Enter numerator
```

● *How accurate do you want your decimals?*

```
328 / 3564 = 0.092031425364
329 / 3564 = 0.092312008978
330 / 3564 = 0.092592592592
331 / 3564 = 0.092873176206
332 / 3564 = 0.093153759820
333 / 3564 = 0.093434343434
334 / 3564 = 0.093714927048
335 / 3564 = 0.093995510662
336 / 3564 = 0.094276094276
337 / 3564 = 0.094556677890
```

● *Mathematical intrigue in two heights*

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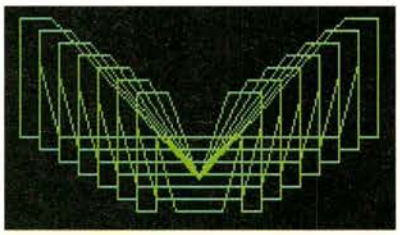
Morph code

Mike Goldberg tries to turn his computer into Mel Smith

MODERN computers have the ability to do some weird and wonderful things – and I don't just mean sending incorrect bills or statements. Today's film and television utilise these machines to produce amazing graphics which are generated from a mass of calculations at lightning speed.

Lately you will have witnessed the bizarre spectacle of human faces transforming themselves into other people's faces – and a gorilla – with seamless precision. This is highly advanced cartoon *inbetweening* applied to video images.

Before this sophistication it was only possible to transform easier shapes and outlines from one to another. So having *morphed* a rectangle into an *impossible triangle* 10 years ago on the Beeb, I thought I would see what today's home micro could do and if it was any easier.



Well certainly the animation is smoother owing to *bank switching* and sheer processing power and the programming is very similar.

Basically the shape to be translated needs to be made up of a certain number of recognisable points or nodes. Each node is numbered and joined by lines sequentially – see Figure I.

If we want to transform this *M* into a *K* all we do is move shift each node from its old coordinates of the *M* to the new ones of the *K* as shown in Figure II. There are two ways this could be done.

Node works ahead

One is to find the vector displacement between the old and new coordinates and set a fixed number of moves for each node until the new image is drawn. With this method the animation is smoother and more united as each change is completed at the same time as all the rest. This was the way I programmed my BBC Micro version.

This time I have used a less coordinated method by which some nodes reach their destination before others, but it's far simpler to understand and is great fun to watch.

Firstly the original node's x-y coordinate is compared to the corresponding x-y of the new image. We can deduce from this the displacement or offset required to make the nodes travel from their old x-y to the new.

Taking node 3 as an example, its original x-y in the *M* shape is 120,56 and it needs to get to 40,120 in the *K* shape. So the x offset each time must be negative and the y positive. The actual offset used is 4 or -4 for all nodes which is why some finish before others.

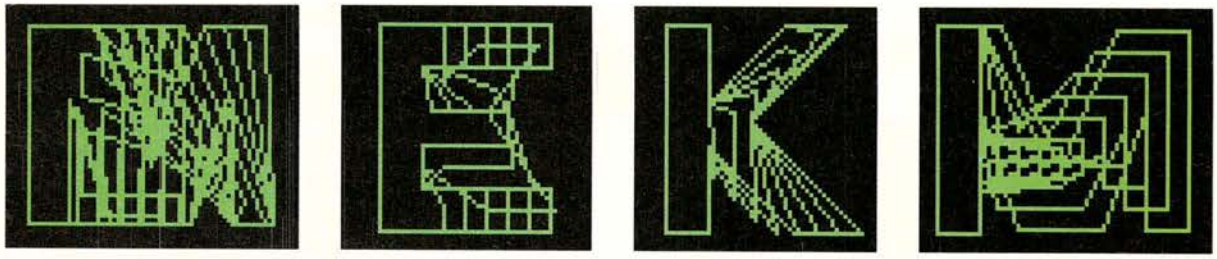
The whole process works like this: Each original node's x-y is looked at sequentially and compared to the corresponding one of the new image. If the x coordinate of the new image is greater than the old one, 4 is added to the x coordinate of that node. If it's less, 4 is subtracted. Similarly with the y coordinates.

Once the next position of each node is found the screen is cleared and the points all joined up to form the current image – which is sometimes very peculiar. The process is repeated until all nodes reach their destination.

If the new image has less nodes than the original it's best to make a particular node in the new image a multi-node, that is node 10 is also 11 and 12 in our example.

As long as the new image has no more nodes than the original you can create any shape you wish by simply storing the coordinates as data, adding a new line to PROCrestore and calling PROCmorph1(x) where *x* is the WHEN number used in PROCrestore

To avoid the *restoring to a line*



● *Some of the effects you can produce with morphing*

number syndrome PROCrestore accepts a number and uses a CASE statement with RESTOREs on each line to restore to specific lines.

Special effects

Along with this *image processing* I have included a number of effects (fx) procedures that also manipulate the image. Fx1 moves the whole object in a straight line whereas fx4 makes it follow a circular path. Fx2 just moves the six lowest points of the letter *M* and fx5 deals with a vertically bisected image, moving each half in opposite directions.

Fx3 either *inflates* or *deflates* the image depending on the value of the parameters sent to the procedure. Generally the parameters for the procedures are thus:

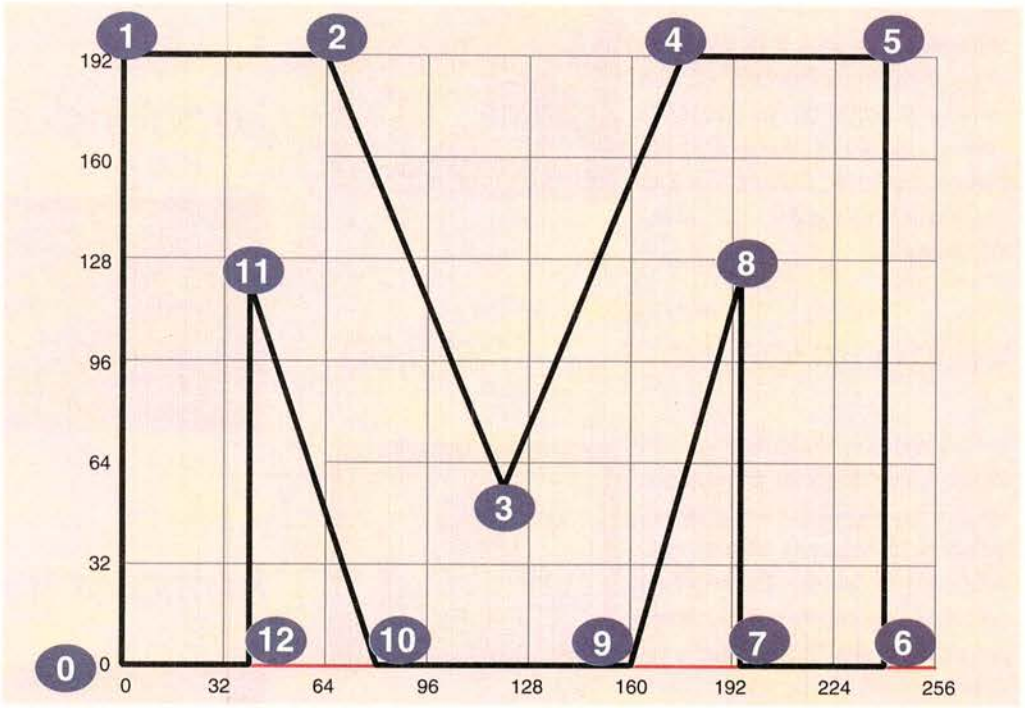
```
PROCfx1(8,8,32)
        | | |
        | |  Repeats
        | y offset
        x offset
```

This applies to all the fx procedures except PROCfx4(n,n,n):

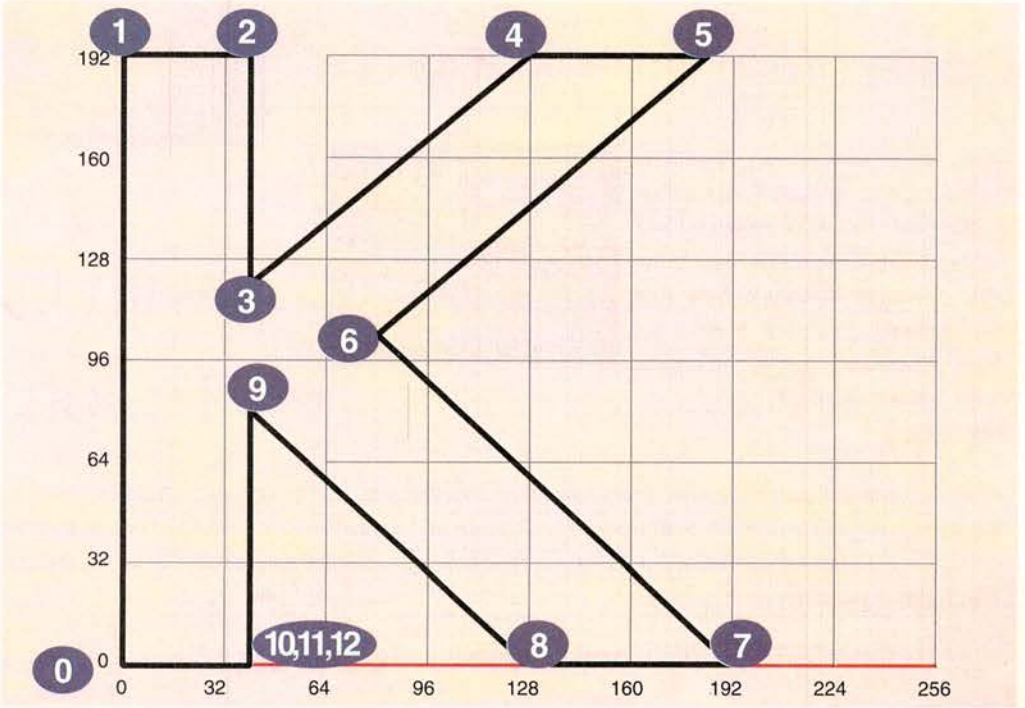
```
PROCfx4(128,59,0 or 1)
          | |    |
          | |    0 = rotate some of the
          | |        object
          | |    1 = MOVE whole object
          | |        in a circle
          |  number of six degree turns
         radius of the circle
```

Some surprising results are obtained by deflating or imploding an image when the nodes begin to pass each other going in opposite directions as you will observe. This result is difficult to visualise and is something really only a computer can do.

● *Now imagine that instead of translating a mere dozen bits of information you do the same to a couple of million and you are on the right track for how Mel Smith can change into Lenny Henry. I'm sure that some Acorn software house will come up with suitable morphing code soon enough with a tie-in to Replay.*



● *The letter M broken down into its key points*



● *Morphing to K results in several points combining*

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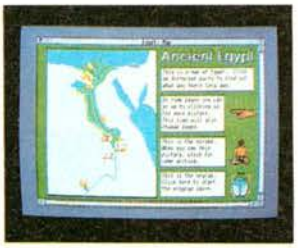
Ancient Egypt £45.00



Ancient Egypt is an application to support the Supplementary study unit in History at Key Stage 2. From a map of Egypt, children can select areas of interest and explore them. The application is supplied at two reading levels. Discs of the drawfiles used and of scanned sprites are also available for use in other applications.

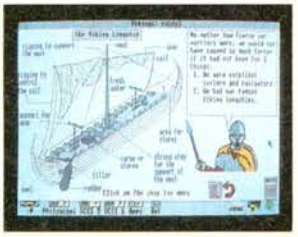
Key Stage 2

Saxon Life £45.00

Saxon Life and Viking Invaders support Key Stage 2 Core Study Unit 1, Invaders and Settlers. This application follows the history of the Saxon settlement and gives extensive details of lifestyle and beliefs. Problem solving exercises in which the children take the part of Saxon settlers are provided on a separate disc.

Key Stage 2

Viking Invaders £45.00



A lively and entertaining account of the impact of the Vikings on British society. Children can follow the history of the time as well as learning about lifestyles, trade, beliefs and the influence that the Vikings still have in modern times. Maps, pictures and text show how Britain formed a part of the much wider Viking world.

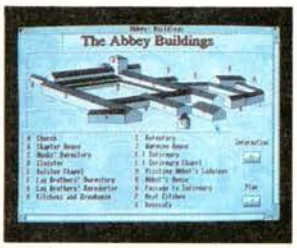
Key Stage 2

Castle Life £45.00

Castle Life is aimed at Key Stage 3, in particular CSU 2, Medieval Realms and the Castles and Cathedrals supplementary study unit. The 57 illustrated pages in this application allow children to make their own exploration of a castle, to see it as a living community and to follow its development through time.

Key Stage 3

Cistercian Abbeys £45.00



This application can be used as part of an introduction to Core Study Unit 2: Medieval Realms at Key Stage 3 or as part of a Key Stage 4 GCSE course. 75 linked pages allow exploration and investigation of the buildings of an abbey as well as examining the role of abbeys in society and developments in the mediaeval world.

Key Stage 3 & 4

Local Industry £95.00

This 500 page application explores the history and development of industry in the Sheffield area. It is structured to encourage open ended investigation of real historical data at all ability levels. Pupils can use, analyse and cross reference the materials. This is a whole school resource with relevance across the curriculum.

Key Stage 3 & 4

Battle of the Somme £95.00

(£145 with Laservision Disc)

This unique application makes use of laservision technology (even your old Domesday player!) to deliver a graphic, moving and effective teaching resource. Original film from 1916, interviews with survivors, soldiers' letters, songs, written accounts and a database make this one of the best multimedia applications available.

Key Stage 3 & 4

with Oak Solutions' History Courseware

All these applications support the three History Attainment Targets as well as Technology AT 5. Drawfiles, sprites, sound, animations and text files can be easily saved by the user and re-used in a word processor or database. Each application is accompanied by a set of photocopiable worksheets and a booklet of teacher's notes. All applications are supplied with a site licence. Local Industry is designed to be installed on a hard disc. All titles are available on Archimedes, please enquire about availability on PC platform.

Oak Solutions Ltd. Suite 25 Robin Enterprise Centre Leeds Road Idle
West Riding of Yorkshire BD10 9TE Tel: 0274 620423 Fax: 0274 620419

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KidPix

John Clemence takes a look at a new way of creating pictures

PRODUCT SPOTLIGHT

Product: KidPix
Price: £37.50
Supplier: ESM, Abbeygate House, East Road, Cambridge CB1 1DB.
Tel: 0223 65445

KIDPIX is an art program designed not just for children to draw and paint but also to have fun. It has a set of 12 basic tools but each of these has a veritable battery of extras, some of which are enhancements of basic tools, others create random effects and some are just good fun.

The program is loaded by double-clicking on the *!KidsArea* application so that the software knows where pictures are to be stored, and then on the *KidPix* icon.

The whole screen is used so children don't have to know about the usual icons for controlling windows. There are just three headings across the top of the screen: *File*, *Goodies* and *Desktop*. A column on the left-hand side of the screen is dedicated to the tool box and colour palette while a strip across the bottom shows the variations available for the tool currently selected.

Filing includes access to the printer and allows for printing different sized pictures. The Goodies menu has options for switching off the sampled speech and other sounds that the program uses. It also lets you modify the program for young children which bypasses the filing and printing operations.

Apart from the normal range of tools for drawing lines, rectangles, ovals, entering text and filling areas, there are a number of less conventional tools each with a wide variation of special effects.

For instance, the *Wacky Pencil* has six different thicknesses, shapes and effects including a rainbow pen. This is complemented by a *Wacky Brush* which has 28 special effects including one which paints in two axes of symmetry.

There is a *Rubber* which not only has a choice of sizes but a whole range of entertaining ways for clearing the screen including a stick of dynamite.

The children in my class particularly enjoyed using the *Rubber Stamp* which gives you access to 114 different ready-made pictures which – by holding down the Shift and/or Control keys – can be used in three different sizes.

There is even an application for editing the stamps or adding your own, although I was unable to do this without deleting one of the ready-made ones.

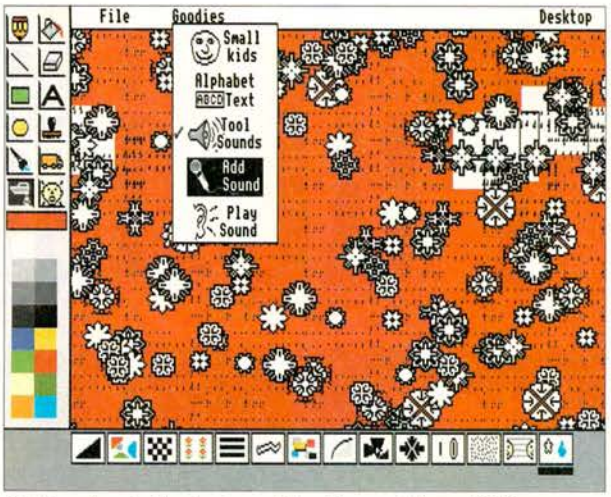
The *Electric Mixer* is able to reduce the whole screen into a montage made up of small versions of the whole painting among other things, with cutting and pasting achieved using the *Moving Van*. This can be set to different sizes or there is a rubber band effect for enclosing larger areas of the screen. Once the area has been selected, a magnet appears so that you can pick up the area and then drop it somewhere else.

Among the most amusing tools is the *Undo Guy* who has a happy habit of saying, in a very human voice: "Oh no!"

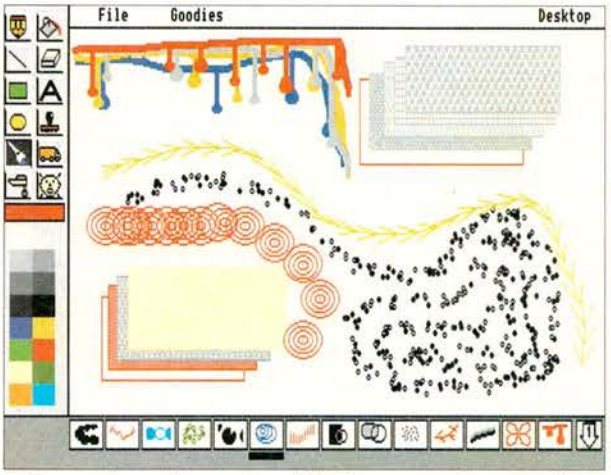
Summing up

The manual is mostly concerned with how the software can be used to support a range of classroom activities. Information on how to work the program is adequate but brief. It did not mention the contents of the *reveal* directory supplied on one of the two disks. Indeed, on installing the software to hard disk, using the supplied utility, the contents of this directory vanished altogether.

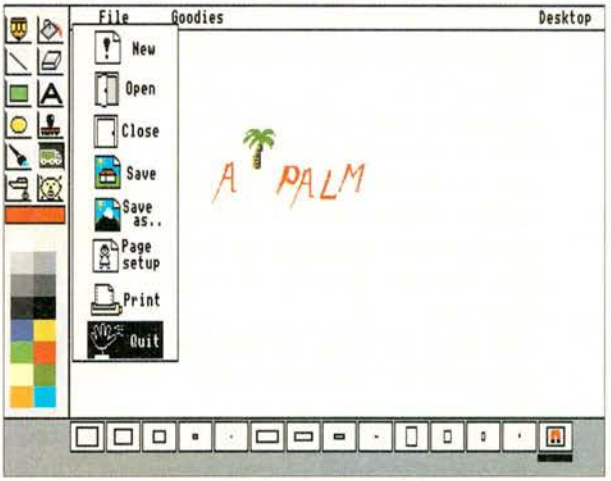
All in all, I was most impressed with this program. Its rather jocular approach belies quite a powerful art program which really does appeal to kids and gives them plenty of scope for exploration.



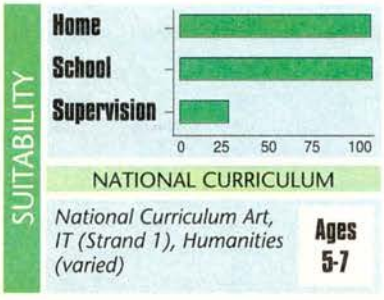
● *Adventure is the key to getting the most from KidPix*



● *Try out the options and special effects as much as you like*



● *Instructions are graphical and easy to follow*



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The BJ-200 prints at 360dpi, which means it is able to reproduce top quality scanned images and text (practically indistinguishable from a laser printer) and thanks in part to the TurboDrivers it is also the fastest printer in its class.

ScanLight 256 can capture photographic quality images and is supplied with software that provides image enhancement capabilities. This is the simplest way to get quality pictures into your documents.

Impression Junior is part of the Impression family, which has become the most successful word processing/DTP program on the Archimedes. For the educational or 'office at home' user Junior is the ideal combination of word processor capability and desk-top-publishing features.

To make this package even more attractive we are giving Impression Junior free when you purchase the BJ-200 and ScanLight products together. Taking into account the discount we already offer on the BJ-200 printer, this means you can save over £200 on the recommended retail price (inc VAT) of the individual components. Look at the standard prices and compare the total with our Publishing pack price.

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Finding le mot

Marshal Anderson explores a new package to help foreign language studies

LEXICON is designed to help with modern languages, displaying a computerised notebook on the desktop which is meant to grow, as students progress, into a tailor-made dictionary with several useful features.

Words can be allocated a reference and placed in named groups so they can be accessed via those groups. The dictionary can be restricted to a particular range of groups depending on the given circumstances. So, how does it actually work?

We tried the German version first and were given a number of windows to deal with. The first was the list window which contained some of the 20 words provided with the package. This list gives a fairly straightforward English-German translation dictionary with gender indicated. The list is in alphabetical order and paged through with the mouse.

Clicking on a given word brings up a further window with details of the word including the groups it is part of and a free text area for any notes, examples and so on. It's worth noting that the words are stored on disk and access times could get quite long with large dictionaries on floppies.

Adding words to the dictionary is very simple – each word can be attached to 64 user-defined groups and the free text area allows you to add as much detail as you want.

Throughout all this dictionary creation the various accents and special letters you need are available from the keyboard – the Russian version provides the entire Cyrillic alphabet.

Setting up new groups is also simple and the groupings window gives you control over which groups are shown and which are omitted. This means that if, for instance, you had a large general dictionary but wanted to do some writing about a train journey you could select just those groups related to that subject area, so speeding up the search.

Further grouping can be carried out via the reference function. This is a very uncomplicated system which attaches a number to each word. These are then accessed and sorted using this number which might mean anything from a chapter in a book to a difficulty level.

While the system can be used on its own as an extendable dictionary, this is not really a justifiable use of the computer's power in a classroom. However, it comes into its own when used with a wordprocessor and as the whole package is multi-tasking it operates well alongside packages like Etoiles.

Lexicon makes very good use of the Risc OS 3 interactive help system, guiding you through its more esoteric aspects and is really a must as you first start to explore.

It has to be said, though, that the very completeness of this package causes some problems. There are a huge number of facilities in addition to those described above but these clutter up the operation of the simple stuff. The manual is rather technical and makes the unwarranted assumption that the user is familiar with the desktop environment.

There needs to be more guidance here as it is very easy to swamp the screen with unwanted windows, most of which are not re-sizable so they cannot be tucked away on the edge.

There's no doubt that wide-screen modes like 39 are a great help here – if you have them.

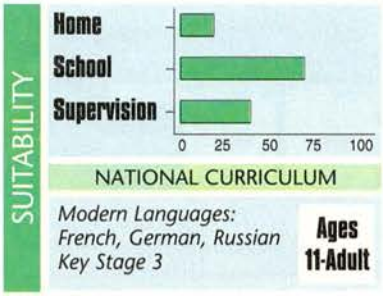
PRODUCT SPOTLIGHT

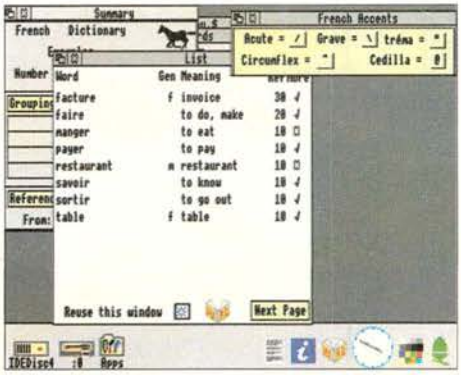
Product: Lexicon
Price: French/German £40, Dictionaries £20; Russian £45, Dictionary £25
Supplier: Stallion Software, Arundel House. Arundel Road, Camden, Bath BA1 5JX.
Tel: 0223 483236

Summing up

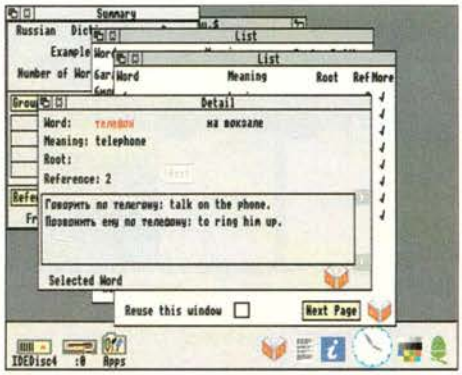
While it looks like an immense task to build up your own dictionaries, several students adding to the same one would very quickly provide a substantial resource. This is not a task teachers should be expected to do for themselves. The ready-made dictionaries come with a free site licence so that makes them quite a good buy if you're running several copies of the package.

Lexicon is a useful program that should have applications throughout the secondary school, though it's not really suitable for the average home.

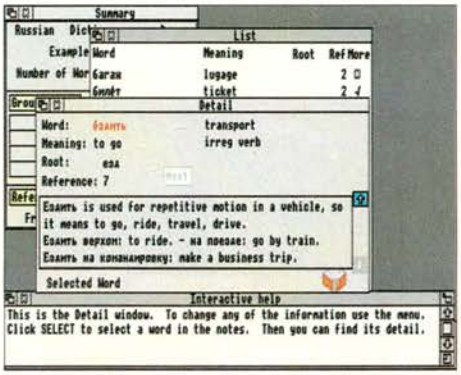




● *You can build your own dictionaries on any subject*



● *The Russian version makes use of the full Cyrillic alpabet*



● *Risc OS 3's interactive help is used to good effect by Lexicon*

Sett in your ways

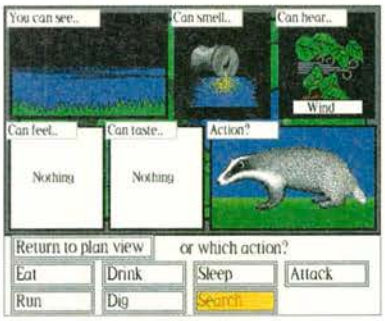
Rog Frost jumps on the trail of a lonesome badger in an exercise in survival

BADGER Trails is a new curriculum pack from Simon Hosler. The two-disk pack contains a program, some fonts and some lovely badger pictures in Draw format and a video. In the program you take control of a badger who has been transported some distance from home. The task is to get him back to his own sett, keeping him fed, watered and safe on the way.

Before reaching the software there is the video and the story. The film – VHS format – tells the true story of how two people set up a hide and became trusted by a family of badgers and how after a period of filming the badgers were weaned off human aid.

The rest of the story is fictitious and suggests that as the hide was removed, one of the young badgers climbed into the van and was driven away. Hence the need to return.

The video is good, with some lovely shots of badgers plus other animals. The book is a pleasure to read and sets the scene for the main activity very well.



● *Dangers abound for the unwary from pollution to men with guns*

PRODUCT SPOTLIGHT

Product: Badger Trails
Price: £39.95
Supplier: Sherston Software, Swan Barton, Sherston, Malmesbury, Wiltshire SN16 0LH.
Tel: 0666 840433

The software has all the hallmarks of a Hosler production. The graphics are good and the control of the game is easy.

The game starts with a badger on the drive of a house. The first task is to find three different items of food and water and get the badger across a busy and dangerous road.

The program takes the form of a standard adventure. You steer Brock around by compass directions and can get him to use his senses.

No words need to be typed. All human actions involve selecting items from menus. This means that the program is suitable for a wide variety of youngsters, including those with spelling difficulties.

Further adventures of a similar type follow. A place to sleep must be found before a second journey through orchards and across fallen trees, with more food required, before finally returning home with a flea-free coat.

You'll have to learn to think like a badger or you'll encounter problems. Most of the troubles are of a human kind but I found out that badgers are not good swimmers when Brock drowned in a river. I should have read the badger survival guide which is a part of the pack.

The maps which show the badger area are also very useful. They don't show you where to dig for bluebells or worms but they do show you where holes in the ground – potentially suitable for a badger – might be found. They also show trees, water and the whereabouts of houses and roads.

The final item in the pack is the program guide. This explains the basic running of the program but also gives more details useful to the supervisor.

Simple instructions are given for quitting from the program, controlling the sound level, saving screens or directly printing them while running the adventure.

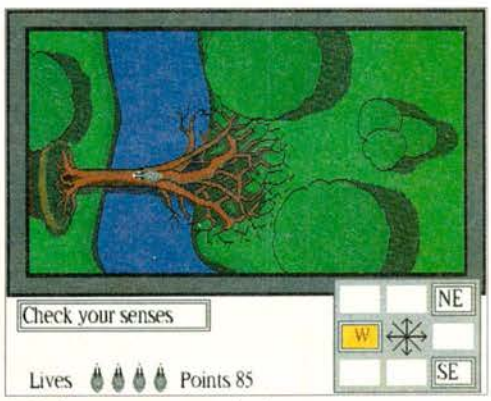
There is also a substantial section explaining which areas of the curriculum fit in with the program.

Summing up

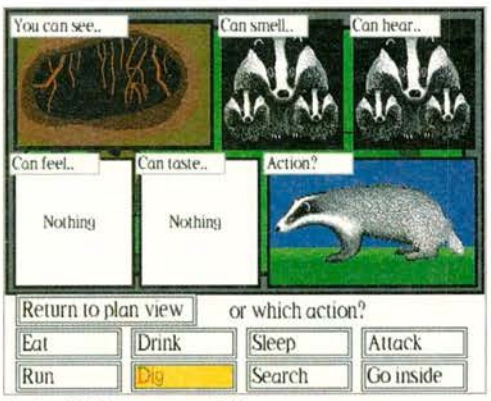
In terms of the National Curriculum, Badger Trails is aimed at Key Stage 2. Secondary schools may find it hard to use the software because most run a subject-based timetable and activities like this take more time than is on offer to most older pupils.

Having said that, the problems that are posed by the adventure are very suitable for pupils of Key Stage 3 age. Indeed, during a half term break, my 12 year old daughter asked her friends to play the game and it generated lots of good ideas and enjoyment.

In short, the package is excellent value for schools and well worth a try at home as well.

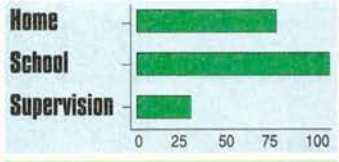


● *Badgers are not good swimmers – so find a safe way to cross the water*



● *Could this be home? Use your senses to make decisions*

SUITABILITY



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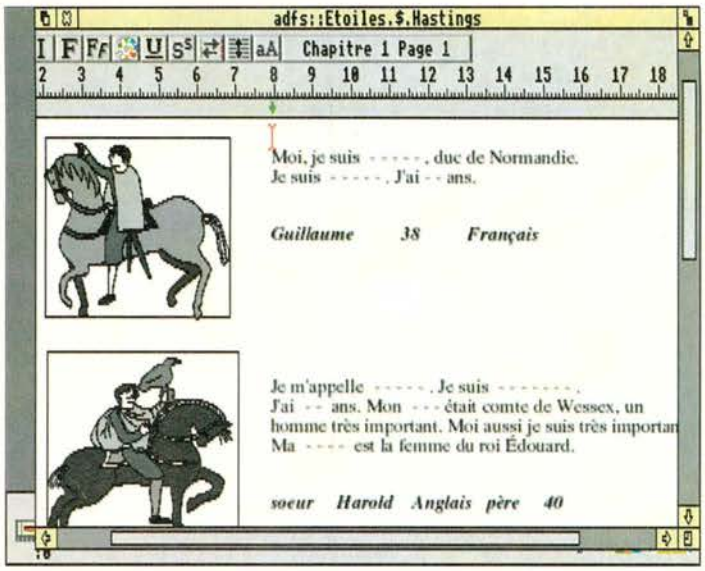
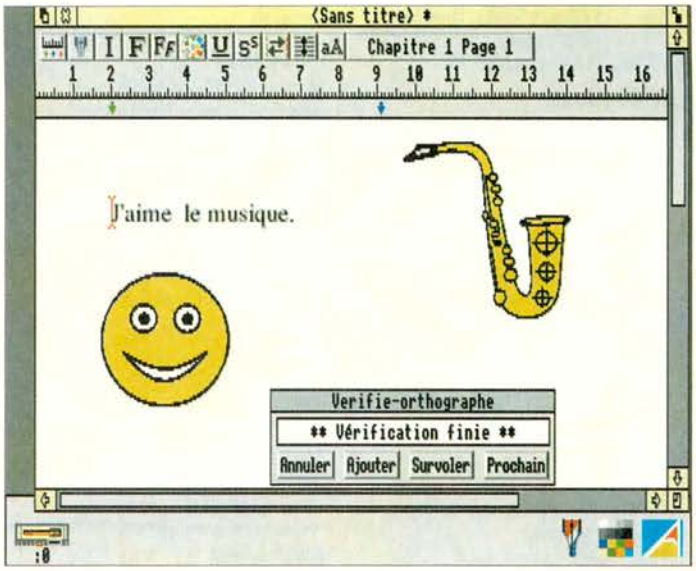
Ages 7-14


adfs::Etoiles.$.Hastings
Chapitre 1 Page 1
Moi, je suis - - - - -, duc de Normandie.
Je suis - - - - -, J'ai - - ans.
Guillaume 38 Français
Je m'appelle - - - - -. Je suis - - - - - - -.
J'ai - - ans. Mon - - - était comte de Wessex, un
homme très important. Moi aussi je suis très importan
Ma - - - - est la femme du roi Édouard.
soeur Harold Anglais père 40

● *A cloze procedure excercise helps you to gain familiarity with the keys*



● *Lovely pictures, but the spell checker allowed 'le musique'*

C'est si bon!

Phil Tayler tries out a French wordprocessor, and finds it *formidable*!

PRODUCT SPOTLIGHT

Product: PenDown Etoiles
Price: £54
Supplier: Longman Logotron, 124 Cambridge Science Park, Milton Road, Cambridge CB4 4ZS.
Telephone: 0223 425558

LONGMAN Logotron's excellent PenDown Plus has been used extensively in primary classrooms, following on the earlier success of PenDown on the BBC Micro and the A3000. Now, in an attempt to show secondary schools just what they have been missing, *PenDown Etoiles* is launched.

An interesting point about the title is that the software is specifically designed to complement the new *Etoiles* French course from Longman and BBC TV, which covers the National Curriculum Key Stages 3 and 4 for Modern Languages.

Though the two do work extremely well together, I am sure that you will find PenDown Etoiles to be a very useful program in the French department or at home whatever French scheme you may be following.

It's immediately easy to use, even for someone who has no previous experience of the PenDown products. The screen layout is identical to PenDown Plus, with a clear and uncluttered feel.

One of the very few criticisms I would have about the normal PenDown Plus package is that it contained so many features, that many primary schools would choose to leave some untouched. Secondary school pupils will find the ability to add footers and headers, design master pages for a more consistent document, add automatic page numbering and to merge texts together to be essential and all these are very well implemented.

Perhaps the most important aspect of the program is that students will be able to work within an entirely French environment.

All the menus are written in French as are the excellent spelling checker and dictionary options.

A 72,000 word dictionary is available, and the *mot juste* option includes several phrases, such as *Je n'ai pas de*, as well as nouns, verbs and so on. The link with the television series is apparent here, for all the vocabulary from the series is included.

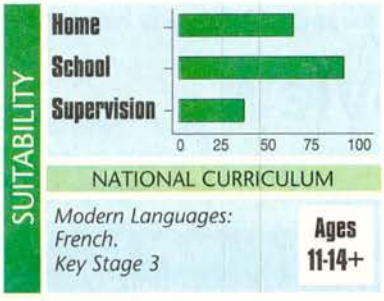
Obviously an ingenious teacher could already be using a normal wordprocessor for French, but the problem has always been how to print accents. PenDown Etoiles uses the function keys for these, and this proves immensely easy to use.

Summing up

What makes PenDown Etoiles more than just a wordprocessor is the ability to import sprite and drawfiles directly on to the page, where they can be scaled and moved. This makes the program useful to students writing letters to pen-friends, diaries and so on, and to teachers preparing worksheets and other materials.

Included on the disk are a number of exercises to give the student familiarity with the program, complete with their own drawfiles. By using these, students will soon feel confident with the use of the software. The excellent guide is also entirely in French, except for a few bilingual pages about the icons and menus.

The only criticism I have is that the spelling checker would pass *le fille* as correct, because it checks le and fille separately. It would be useful to check gender, but c'est la vie!



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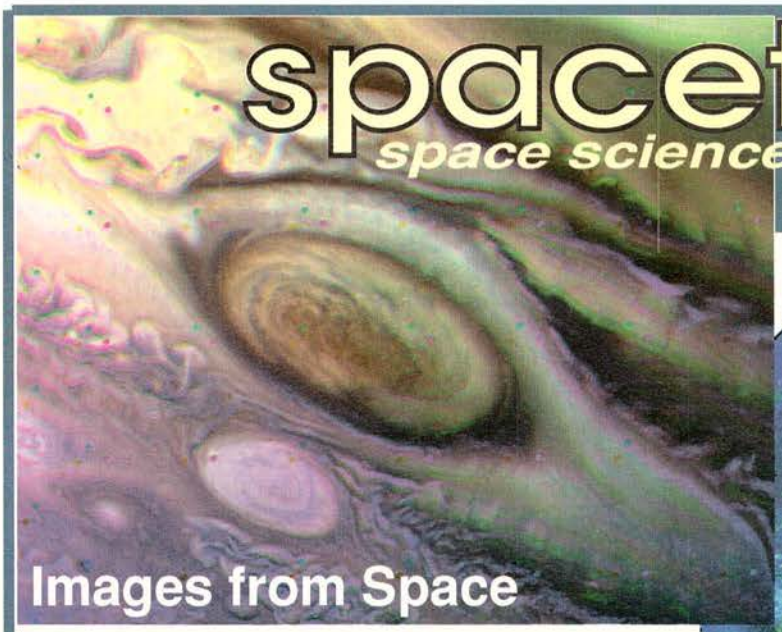

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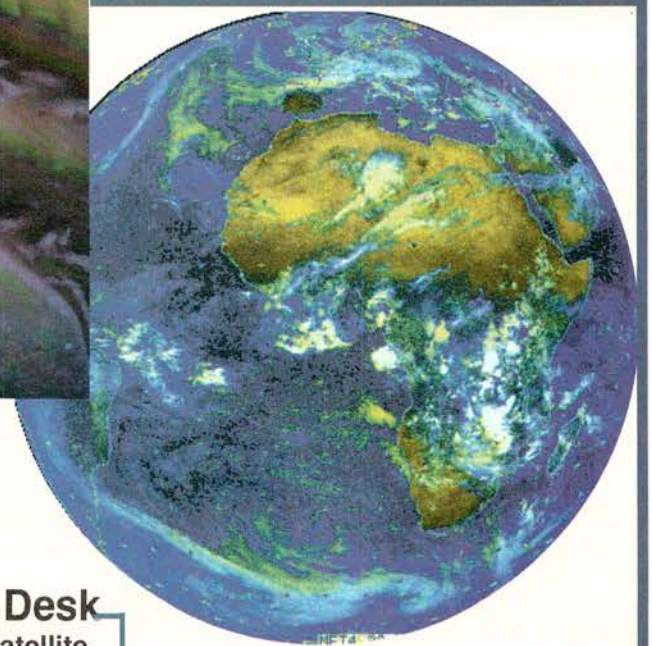

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Hole in the ozone

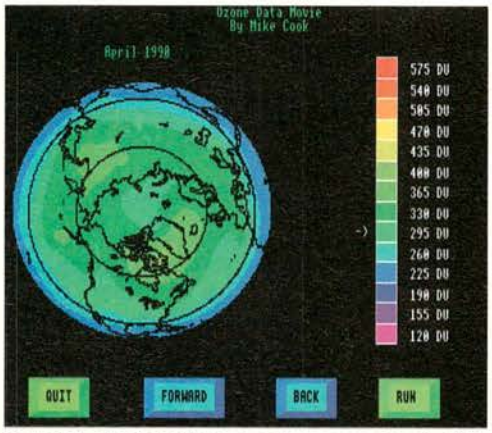
In the first instalment of a two-part article, Mike Cook reflects on an important environmental issue

ONE of the hot topics of popular scientific debate at the moment is the ozone layer. It features in government advertising, children's nightmares and, in fact, has become a cause celebre equivalent to the seventies Save The Whale campaign, a rallying cry that brands you with a set of ideals.

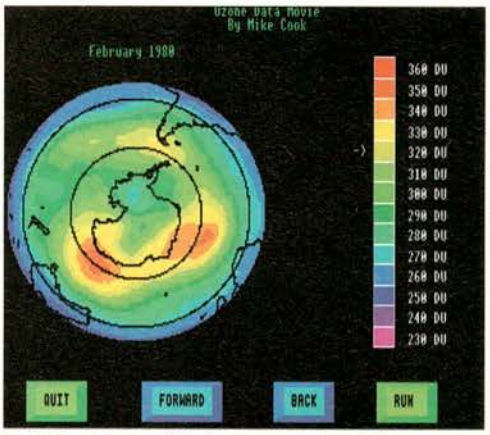
Unfortunately, like a lot of scientific subjects the popular press pick up on, there is muddle and confusion from journalists just interested in a sensational story. An illustration of this is how the subjects of global warming and the ozone layer have become inextricably linked in many people's minds. In fact, they are two totally different areas of concern with different causes and consequences.

So why is a computer magazine devoting space to this topic? Well it is only through the use of computers have we become aware of this problem. It is only by getting computers to gather masses and masses of data, average it, analyse it, and finally draw pictures, that we can finally see a pattern emerging.

Not only that, but NASA have released the raw data in a form that is suitable for our home computers so that we can be front line scientists and see the patterns emerging on our own desktops.



● *Is this a hole in the ozone layer over the Arctic?*



● *Antarctica and its famopus hole – 10 years ago*

What is ozone?

So we have all heard of ozone but what is it? Well for starters it is not what we smell at the sea side. *Can't you just smell the ozone ?* says the day tripper emerging at the promenade.

Well in fact you can't. Ozone does have an astringent chlorine-like smell but the smell that day trippers love is derived from sea weed rotting in salt water. It may be pleasant but it isn't ozone. In fact ozone is a molecular form of oxygen. Normally oxygen atoms go round in pairs but in ozone they go round in groups of threes.

Now oxygen is highly reactive at the best of times, which means it likes to combine with other chemicals – one of the reasons that life evolved to breath it.

When a chemical reacts with oxygen it forms an oxide. Burning is one form of reaction and that normally produces carbon dioxide.

Oxygen can also react with iron, and produces iron oxide or rust.

However, when oxygen is in the form of ozone it is even more reactive and is likely to attack all sorts of other substances.

This is because the extra atom is not tightly bound to the other two and is very willing to oxidise a large number of other substances.Ozone is created by the action of light on oxygen. If the light is strong or of high energy more ozone is produced. High energy light is towards the blue/ultraviolet part of the spectrum. In fact ozone is produced in a lot of types of laser printers and photocopiers.

This is a problem because ozone is a toxic gas very similar to chlorine used in the first world war trenches. Not only can high concentrations poison you, in slightly lower concentrations than lethal it can cause accelerated ageing. Therefore it is always recommended that laser printers and photocopiers be operated in a well ventilated environment. It can, however, be quite useful – ozone like chlorine can be used in very low concentrations to purify drinking water.

Ozone is naturally present in the stratosphere – the layer of the atmosphere between 10 and 20 ➤

> Without any greenhouse gasses the Earth would freeze, but too much and we will roast

➤

miles high. It is created by sunlight hitting oxygen molecules in the very rarefied air. When a photon (a particle of light) hits the atom it knocks an electron out of it. This is then involved in a number of reactions finally to produce ozone.

Ozone depletion

Once formed the ozone acts as a very efficient blocker of ultraviolet radiation. As it was this same radiation that formed the ozone in the first place it will prevent further build up of the gas. In short it is, or should be, a self-regulating process producing a constant level of gas.

Several factors complicate the picture. For a start the sun's output is not constant but varies slightly over the 11 year sun spot cycle. This affects ozone production.

Secondly, the angle of the sun light striking the atmosphere affects the production, generating more of the gas over the equator than the poles.

Thirdly, global atmospheric movements mean that most of this gas is swept up and ends up over the poles. However, on top of all this is the fact that ozone is being destroyed by pollutants. These include rocket and high-altitude jet exhausts, but the most damaging appear to be industrial.

The finger of popular blame has been pointed at chlorofluorocarbons (CFCs) used in aerosols and refrigerators. They are also used for making plastic foam and industrial solvents.

Basically, these chemicals are usually inert, that is they don't react with anything, but once they escape and reach the stratosphere the sun gets to work on them. The ultraviolet radiation breaks them up releasing chlorine atoms. These are ozone killers, the chlorine takes part in many reactions and emerges unscathed.

It has been estimated that one chlorine atom can destroy 100,000 ozone molecules over a century before it is deactivated or diffuses back to the lower atmosphere to be carried down to the Earth in rain.

What use is ozone?

There are other factors that limit the amount of ultraviolet radiation reaching the surface, scattering by air molecules and by atmospheric dust. However, four fifths of the absorption is performed by ozone.

When the sun is directly overhead, there is 250 times less ultraviolet light than there otherwise would be. Now there are not many places where the sun is directly overhead, and it is not there for long. As the sun sinks lower in the sky its light has to pass through more of the atmosphere, giving greater absorption.

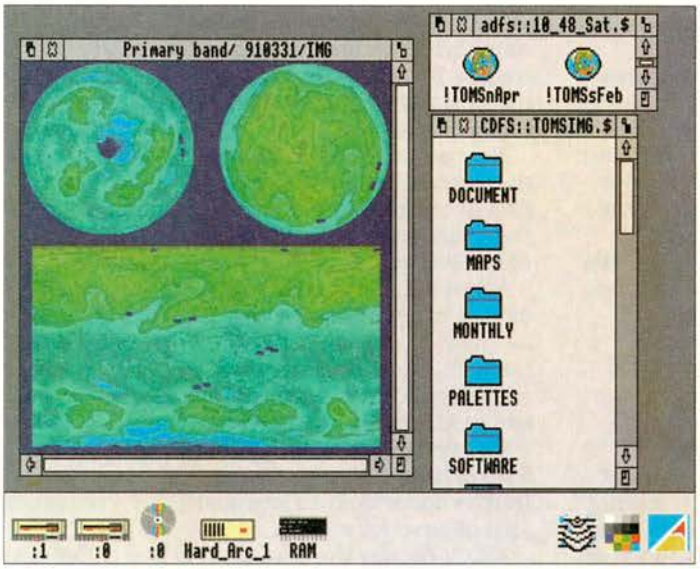
When it is 30 degrees above the horizon it is another 250 times less bright in the ultraviolet than it was when directly overhead. As it is this radiation that gives you a sun tan this explains why it is impossible to get a suntan in this country in the winter no matter how sunny it is. On the southern coast of Spain the sun is 28 degrees high in mid-winter but 74 degrees high in mid summer.

Therefore it would take over six hours of noon sunning in December to have the same effect as one minute in June. The dependence on the height of the sun in the sky on ultraviolet absorption explains why you can very quickly have too much sun on the first day of a tropical holiday. Another reason for this is that the ozone layer is typically 25 per cent less at these tropical latitudes.

Clouds have little effect on ultraviolet radiation, the water droplets in clouds do not absorb but simply scatter. Thin clouds have a much more dramatic effect on visible light. On the other hand ordinary window glass will absorb about 90 per cent of the ultraviolet radiation.

This is why windows on eprom chips are made of mica and not glass. Sand and water reflect about 15 per cent of ultraviolet radiation so it is possible to tan slowly under the shade of a beach umbrella. However, the best reflector of all is snow – this reflects nearly all the uv radiation. This coupled with the fact that there is less atmosphere to absorb it at high altitudes leads to about 40 per cent faster tanning at 10,000 ft than at sea level.

Ozone, like carbon dioxide, is also a greenhouse gas helping to keep the sun's heat in. Without any greenhouse gasses the Earth would freeze but too much and we will roast.



● *Processing a world scan of the ozone layer*

Just a tan?

Whereas ultraviolet radiation gives you a sun tan it also has other effects on the body. The most well known is that of skin cancer, the risks of which are directly proportional to the amount of ultraviolet radiation you receive. However, to block yourself off from all ultraviolet radiation can be harmful as our bodies need sunlight to synthesise vitamin D.

There is evidence that exposure to ultraviolet radiation reduces the efficiency of the human immune system and some researchers expect this to be a worse problem than skin cancer. However, the biggest fears are that marine life and plants at the bottom of the world's food chain may be hardest hit. If this happens there is the possibility of a global ecological collapse.

● *Next month we'll look at what's being done to monitor the situation and what software and recorded data you can get to see what's really happening.*

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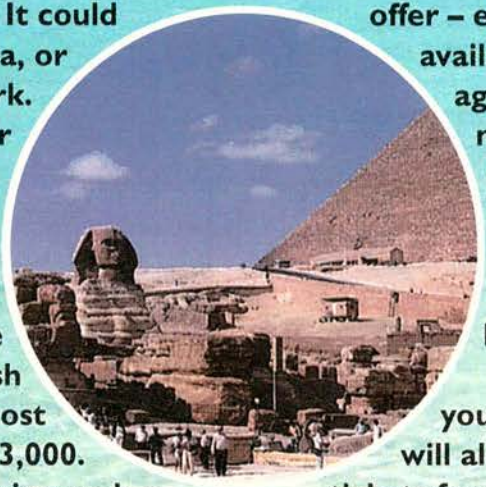

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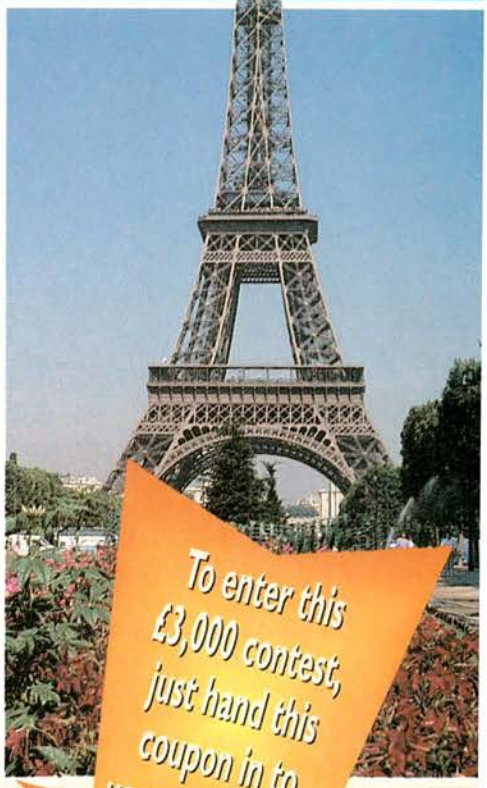
COMMODORE – Three magazines serve the dedicated Amiga fraternity. For games players there is *Amiga Action* (£3.95) and *Amiga Force* (£1.95), while *Amiga Computing* (£2.99) covers every aspect of this versatile machine. Owners of the C64 will find all they need in *Commodore Force* (£2.95).

ATARI – For the Atari ST enthusiast there are three magazines – *ST Action* (£3.95) for gamers, with *Atari ST User* (£.3.40) and *Atari ST Review* (£3.50) satisfying the more general ST owner.

NINTENDO – The whole of the ever-expanding Nintendo scene is covered by *N-Force* (£.1.95), while dedicated fans of the Super NES have *Super Action* (99p) and for Game Boy freaks there's *GB Action* (99p).

PC – Most dynamic newcomer on the PC magazine scene is *PC Home* (£3.95), covering both business and leisure interests. *PC Today* (£3.95) is devoted to supplying practical solutions for the small businessman.

SEGA – All the Sega games machines have their champion in *Sega Force* (£1.95), with *Mega Action* (99p) serving the needs of Mega Drive owners *(to be launched on May 20)*.



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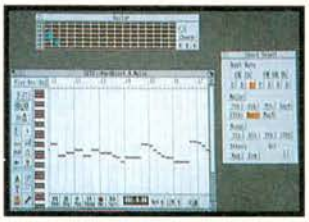

Serenade is a desktop MIDI sequencer for the full range of Acorn RISC OS machines. A great deal of effort has gone into creating a graphical user interface that gives access to the power of Serenade without making it complex to use.

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RHYTHM BED - A MIDI DRUM MACHINE - Rhythm bed is a program which allows you to create percussion tracks for controlling drum machines directly or for export to sequencers, such as Serenade. For those without access to a MIDI system, Rhythm-Bed can access up to eight separate internal sounds.

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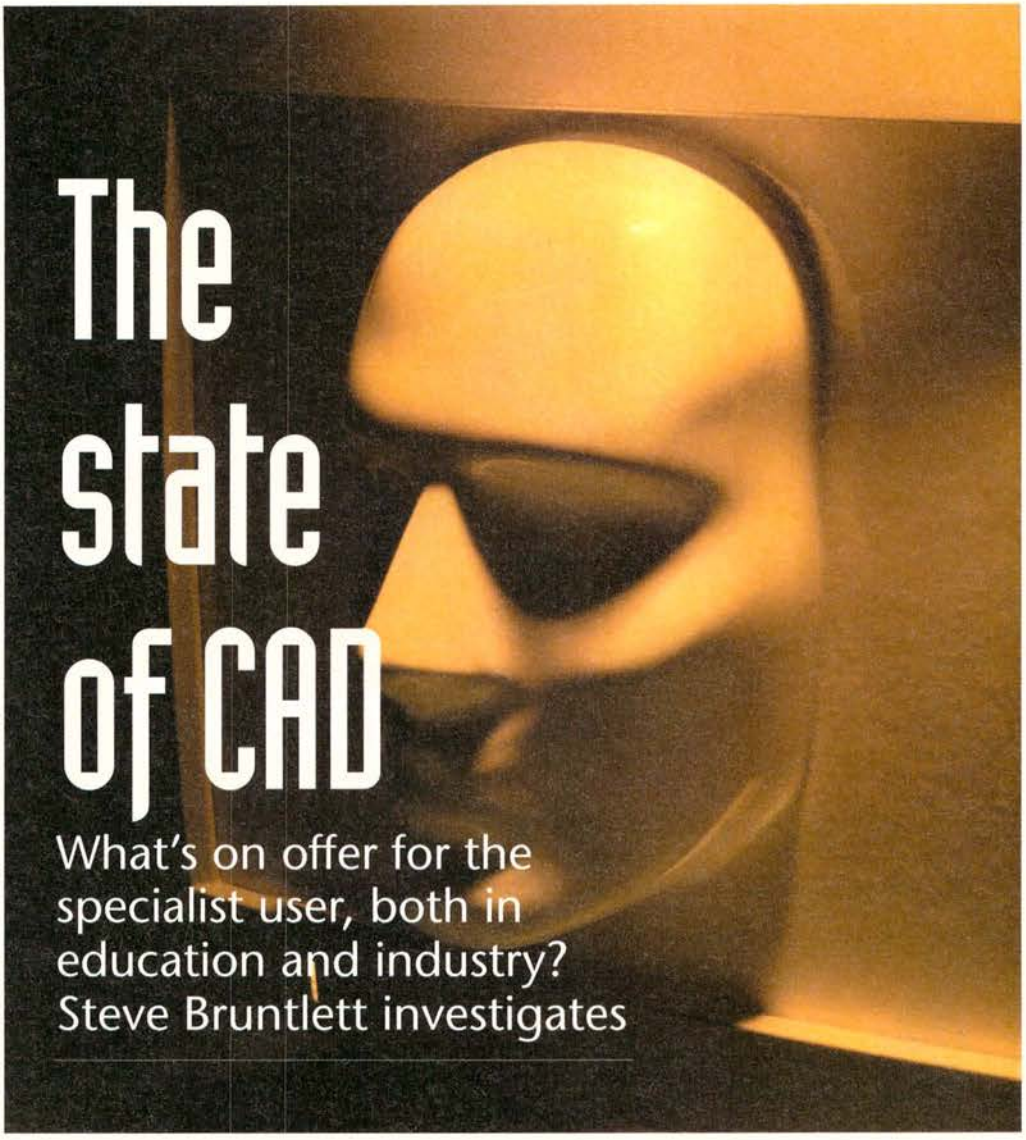


The state of CAD

What's on offer for the specialist user, both in education and industry? Steve Bruntlett investigates

WHAT seems to have happened in terms of CAD development on the Archimedes is that pairs of packages have evolved: Fully specified versions for professional use, and junior versions for home and school operating in the same way but with less options.

Most of the CAD packages covered in this article have a hard copy output but some, such as CNC Designer V3, are designed to work directly with computer controlled millers and lathes.

This is not to say that the other CAD packages can't be linked to such equipment as some companies are developing programmable drivers. Even Draw can be used with a Roland CAMM 2 milling machine to produce quite sophisticated results in MDF, brass, plastic and so on.

Some of the older CAD packages such as Designer V3 and PDT operate in a non-Risc OS way. This doesn't diminish their usability and for old hands who have used a variety of interfaces, such packages should present few problems but they may be a little bit more difficult for newer users.

One of their restrictions is they operate on a fixed screen which means that you can't take advantage of higher resolution modes or larger desktop working environments such as are offered with the new colour cards.

For example, using something like ProCAD with Computer Concepts' Colour-Card on a Taxan 795 gives you a large working area with enough space for a full-scale landscape A3 drawing, prompts and some of the program menus.

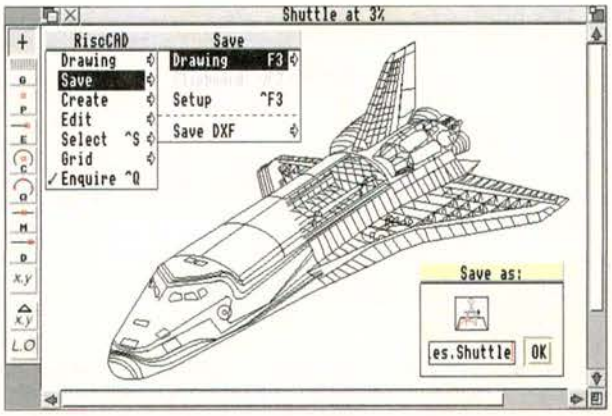
RiscCAD Junior

This package is a subset of the professional version to be released probably just as I've finished this overview. It's been designed for use in schools, colleges and small businesses and caters for engineering drawing and the production of electronic circuits using libraries of suitable components. It works in any screen mode even on a 1Mb machine and once it's up and running, drawing can start in the editing window.

This has a snaps window attached at the left which shows all available snap modes for the tools used for the main drawing. Tools are selected from the Drawing, Save, Create, Edit, Select and Grid sub-menus in Risc OS style.

I would have liked a toolbox rather than going through the menus each time. The use of snap modes is becoming a familiar feature on most new CAD packages as they allow elements of drawings such as mid-points of lines or circles to be lined accurately.

The manual is comprehensive with tutorial and reference sections, key strip and crib sheet for key short cuts. The appendices deal with keyboard short cuts, recommended equipment, hints and tips to avoid overuse of the help line offered with ➤



● *Using the RiscCAD Junior workscreen*

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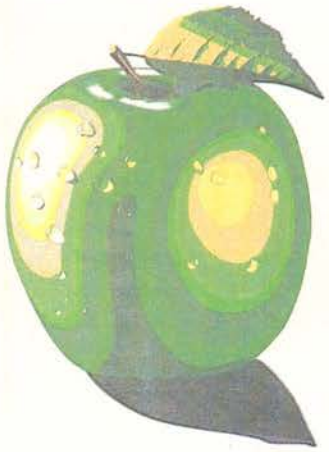

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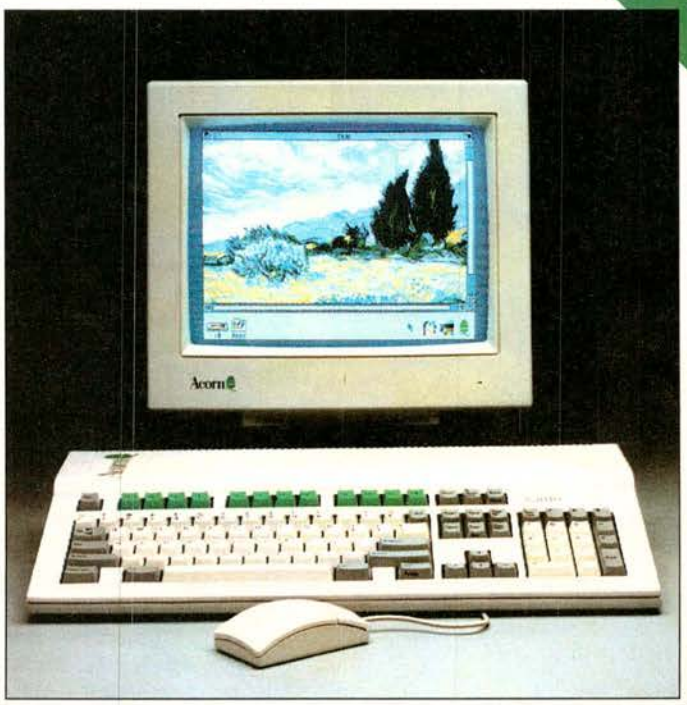


➤
the package and printouts of the logic, contacts, electrical, coils and miscellaneous symbol libraries.

The drawing functions are comprehensive with many options for point, line, circle, arc, text, symbol, dimension and degree of accuracy. The edit menu controls the editing, hiding and stretching of objects, layers, line and cursor style and viewing of X,Y coordinates.

The select menu is similar to Draw, with detailed options for heightened accuracy and allows you to work on several objects at once. Objects can be grouped, copied, rotated and scaled, moved by a specified offset or transformed from a set reference point.

ProCAD

ProCAD is a two dimensional draughting package which builds on the features of CADet and provides many more to produce a professional package in direct competition to AutoCAD in the PC world. CADet was reviewed in the February issue of *Acorn Computing* and should give you an idea of Minerva's CAD strategy.

Although ProCAD's output is professional in quality and would be perfectly acceptable for home and school use, it is for the professional user or anyone producing process plant drawings, electrical circuits, pipe layouts, wiring schedules, office layouts, architectural work, maps, schematic diagrams, graphics, organic chemistry or any type of drawing to be found in business, education, design and manufacture.

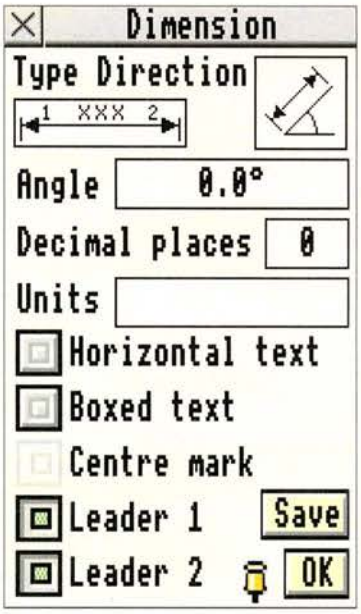
AutoCAD is its nearest competitor on the PC, and AutoCAD users who have seen this package have been shocked by its outstanding performance especially in terms of redraw speeds and ease of installation and operation – not to mention the price difference: AutoCAD costs over £2,000.

The plotter driver plots up to A0 drawings using HPGL although Risc OS drivers can be used with the print options. The second disk contains a good selection of demonstration drawings, frames for A0 and A3 drawings, a set of symbol libraries comprising arrows, BS308 symbols, electrical symbols, logic symbols, map symbols, nut symbols and sanitary symbols for use in drawing interiors.

There is also a drawing of a patio along with a report of materials used developed into a quote illustrating the program's power as a design and production tool.

The manual is extremely detailed, well illustrated and easy to follow. Sections deal with the main and style menus, drawing tools, the use of snaps, dimensioning, layers and text classes, editing drawings, reports, preferences, making the most of ProCAD, the plotter driver, error messages and keyboard shortcuts. The appendix covers external files and how DXF files are used.

There is no tutorial but there are many worked examples contained in sections such as the one dealing with dimensioning which contains illustrations of the principles involved as well as examples of each ➤

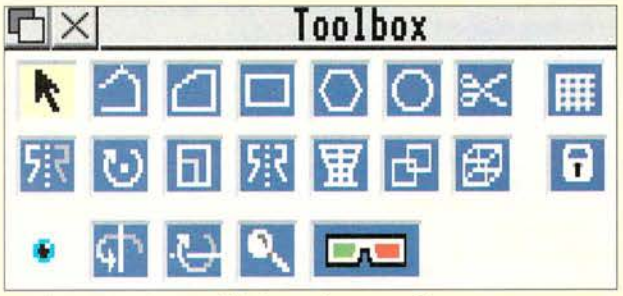


● *There are lots of ways to mark dimensions*

Perspectives

This is a very effective package which allows you to construct 3D wireframe drawings in a fairly standard way using three views and a toolkit. You might wonder why you'd want to produce wireframe drawings and not be able to render or shade them to make them look realistic.

The reason becomes apparent when you don the 3D glasses provided with the package, select the perspective view and watch a believable three dimensional representation of the object you've just drawn moving in real time as you move the mouse. The effect is quite stunning. Now if we could only have hidden line removal.



● *The Perspectives toolkit has a clear set of icons*

Perspectives is aimed at schools trying to get pupils to visualise in three dimensions and in this respect it works very well. It doesn't pretend to be a full CAD package but the facilities are comprehensive enough to produce a reasonably complex object.

The first part of the Toolkit offers a selection of drawing functions and editing tools which are also accessible through the main menu with extensions. These include select, open and closed lines, rectangle, polygon, circle, delete, grid, flip, rotate, scale, mirror, sweep, copy, extrude and a snap lock.

The second part of the Toolkit offers a set of tools which control the size/orientation of the perspective pictorial view. These include reset and zoom pictorial, rotate vertical and horizontal and stereo view. The main menu and sub-menus deal with the options in more detail and also with viewing, perspective, filing, selection, process and printing options.

The manual is clear and concise giving an overview of the package, a section on basic principles, a reference section, advice on the screen layout and a series of worked and illustrated tutorials dealing with basic operations, layers, planes, the use of orthographic views, extrusion and enlarging, sweeping, mirroring and rotation.

These are easy enough to follow and provide a good starting place not only to using the package but to understanding how to draw in three dimensions.

Perspectives has obvious uses in CAD work in Technology but it may also have uses in the production of computer-aided sculpture in the Art and Design department. I'd like to see some artists using CAD packages to see what they can come up with rather than designers having all the fun. Recommended viewing.

● *Working with perspectives*

● *Taking a 3D look at your handy work*

> On the Archimedes pairs of packages have evolved in tandem

of the 13 different styles of dimensioning.

ProCAD allows you to combine drawn items into grouped designs which can be moved, copied, scaled, rotated, mirrored without losing any of the properties of the individual items. Most of the settings can be altered at any time making this an extremely flexible package.

It operates with Risc OS compliant multitasking and offers up to eight user-defined zoom frames per drawing with fast and easy-to-use pan and zoom and access to Risc OS printer drivers.

It has an on-screen prompt messages option, full screen cross-hair cursor, Ordnance Survey and specialised area fills, a wide range of construction tools and text at any size and angle using four built-in fonts or up to 32 outline fonts.

There's a sprite tracing feature, a detailed selection feature, detailed information reporting on drawing objects, a multi-copy tool as well as tools for chamfer, fillet, tangent, angular bisector and so on.

Add to this auto-save, user-defined units and drawing scale factor, parametric symbol insertion, extended projection snaps, a cut-out tool to trim shapes, text search, plotter pen sorting, built-in plotter sorting, communication, maximisation and network support and you'll get an idea of the depth of this package.

In use the program is simplicity itself. The basic window contains a Status bar that can be supplemented with a Message bar, Ruler, Item Information box, Toolbox and Snap bar. The Toolbox, Message and Snap bars are independent units and can be moved around the screen if necessary.

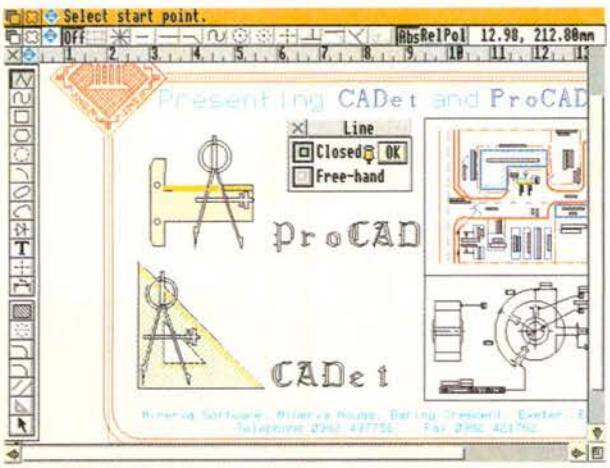
The Status bar gives information relating to the current main drawing features such as the active drawing tool, active snap, current line types and pen colours, for instance.

The Message bar at the top of the screen indicates when the program requires your input. The Snapbox contains all the snap tools for grid points, orthogonal direction, end and mid-points, bends, objects, centres, quadrants, points, perpendiculars, tangents, intercepts and reference points.

These are used so that when the cursor is moved over or near a snap point on the drawing, the cross-hairs will jump to that point and change to a square. This is an extremely useful feature which aids accurate CAD work.

The coordinate mode display is used to display the current pointer position.

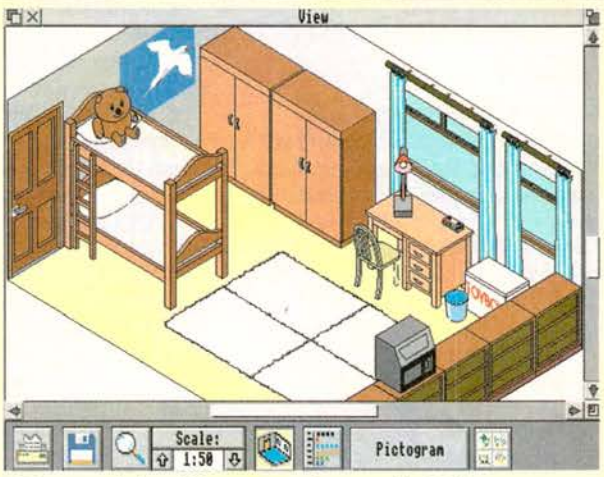
The various ways in which coordinates can be specified, such as in absolute or relative terms and in either cartesian or polar formats, provide an accurate alternative to



● *Pro CAD is fully Risc OS compliant*

SPEX

This is not strictly a CAD package and will be reviewed later on its own, but it seems appropriate to mention it. SPEX is a package which enables pupils of all ages – Explan claim that it is suitable for Key stages 1 to 4 – to design their own environments.



● *You can design different types of room with SPEX*

As such it involves no drawing but placing ready-drawn objects into user-designed rooms. The initial package concentrates on four rooms: Kitchen, bathroom, bedroom and lounge. These will be supplemented with further rooms and environments.

SPEX is not an interior design program, rather it's designed to help develop spacial awareness even in quite young pupils. It comes with a comprehensive A4 booklet of reproducible worksheets for different key stages and a kitchen project booklet plus a disk of clip art.

Some of the concepts that the program seeks to develop are scale, measurement and units, the link between plans and the real world, different methods of presenting information, ergonomic design for certain room types, safe and dangerous room layout, creative arrangement of items, hierarchy and grouping.

To produce a room you decide what size the layout should be. Once the room has been produced using the Planning section, the doors, windows and wall features are placed on wall elevations using the Wall Fittings section.

The room items – which can be from any room using an Item Search are placed using the plan view in the Furnishing section and the whole room viewed in isometric using the View section.

All views can be printed out for reference as well as bar charts, pictograms and spreadsheets showing the use and cost of units which are illustrated in the clear and concise A5 manual. The whole program is well conceived and works like a dream.

● *A complete list of objects – and their costs – can be displayed*

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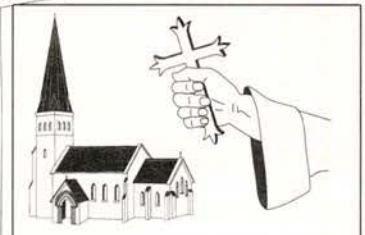

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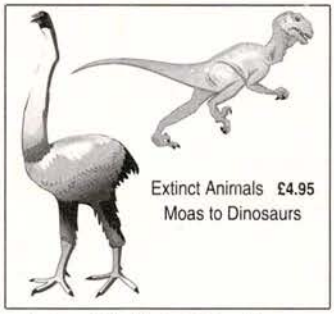

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50 with labels	£32.00 b
100 with labels	£62.00 b
Labels for 3.5" (Roll 1000)	£9.50 a
Library Boxes (Hold 10)	3 for £2.99 a

Second User

Multistore - complete package	£30.00 c
Watford 4 Slot Backplane	£25.00 a
Cumana 3.5" DS 80T drive with PSU	£50.00 c
Watford RAM/ROM board for BBC B	£25.00 b
49Mb (formatted) Rodime ST506	£200.00 d
512K (PC) Board for Master 128	£45.00 b
ROM cartridge (Care) for Master	£9.50 a

➤
mouse entry, especially if used with snaps.

The Toolbox is comprehensive in its range and all tools are instantly available using Select. Using Adjust on tools brings up a dialogue box from which to make further detailed selection. These can be pinned to the desktop for more permanent reference. If you use a high resolution screen mode you can have these pinned round the edge of your working area.

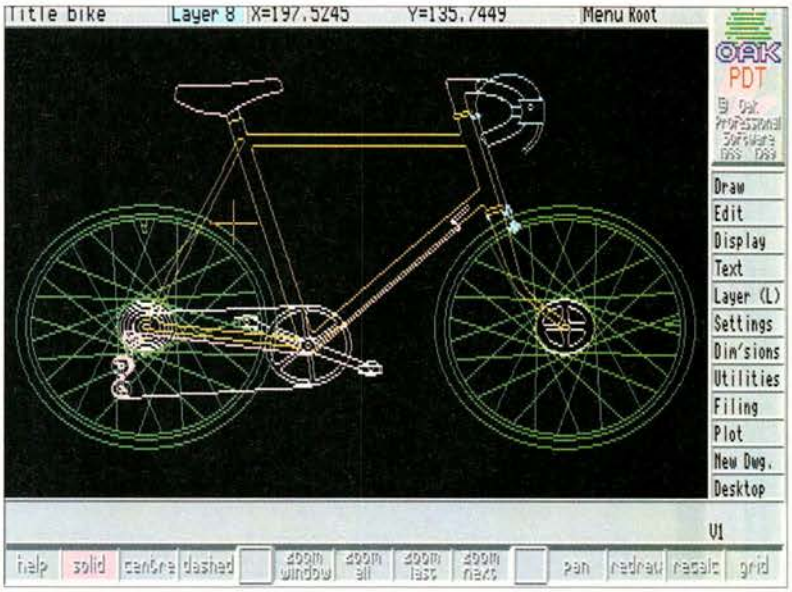
ProCAD is easy to use and its flexibility belies its range of powerful features.

PDT

PDT was released about five years ago and although a fully specified CAD package it has two differences to most. One is the ability to make movies from a series of drawings but more important was its parametric nature.

To explain this feature, imagine you are a designer who wants to create lines at a tangent to two circles such as a bicycle chain round two sets of gear hubs. The computer in a normal CAD program stores the co-ordinates so if you changed the size of one of the gear hubs the chain wouldn't meet at a tangent.

With PDT it's not the coordinates ➤



● *Bicycle built by PDT*

Designer

As far as I can tell Designer V3 was developed from Designer Intro which I reviewed back in the October 1989 issue of *The Micro User* and also featured in the June 1990 issue. It still works well and is widely used in schools as an introductory CAD package with pupils moving up to Designer when they want more sophisticated results.

This is not to say that Designer is more complicated to operate just that it has a more powerful range of tools and options. It is equally as good at graphic design as it is at CAD and could be described as an all-round design package.

It has certainly been developed over the last few years with much user feedback and tailored to meet the requirements of users of CAMM machines which are similar to CNC milling machine but safe and easy to operate in a school or home situation.

Most CAD packages can produce output on a plotter but Techsoft have taken the lead in developing an integrated approach to selling software and hardware combinations for CAD/CAM and signmaking. Designer has also been made easier

TEXT may be used in a variety of Sizes, slants, angles, WIDTHS, SPACINGS, etc.
Many different fonts are available including
RISC-OS outline fonts
Text may be put into boxes, either centralised, left or right justified
or inside
EASILY DISTORTED

● *You can do a lot with the text alone*

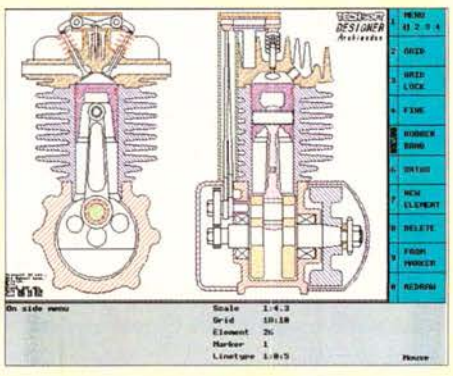
for younger users by the inclusion of a menu editor. The text messages can also be rewritten much more simply or even in a different language.

This level of thinking and tailoring shows how feedback from users can lead to the improvement of an already excellent product.

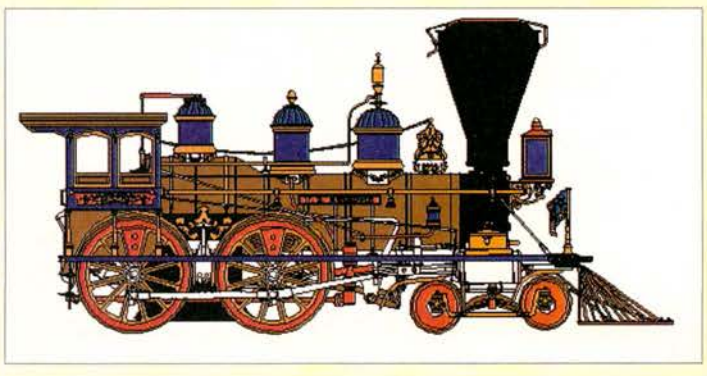
Designer is controlled by mouse, cursor keys, coordinate input or digitiser input. The features are too numerous to go through in detail so here's a selection: Definable grid in both spacing and angle, hunt and lock (snap) on to nearest end of line, arc, centre or arc or circle, zoom, delete any item, last item, part of item, unlimited layer structure, modify command which allows drawings to be stepped through backwards and forwards.

Add to these a comprehensive selection of circle, arc, tangent, normal construction routines, full or partial ellipses defined by axes or encompassing rhombus, comprehensive bezier curve options, comprehensive signwriting facilities which are claimed to outperform those on many signwriting packages and which include the ability to send the work to desktop signmakers.

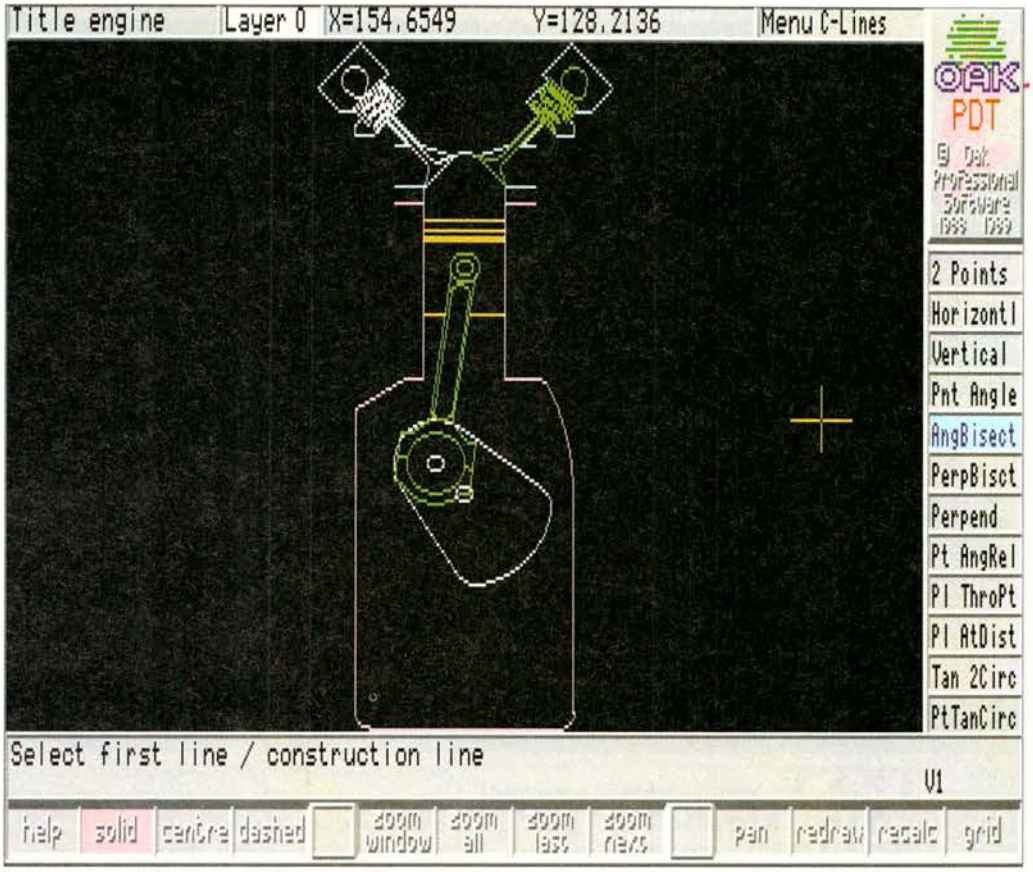
Also included are a font designer, comprehensive dimensioning facilities, hatching, wide paths with different corner styles, comprehensive transformation commands, 3D effects allowing extrusion of 2D drawings, contour facilities, defined lines and points, libraries of drawings, a wide variety of data links and finally output via built-in or Risc OS plotter drivers.



● *Using the main screen of Designer*



● *One of the many exquisite drawings of trains by Fred Sparkes*



● *Moving objects are PDT's strong point*

that are stored but the relationships between the items, so when the size is changed, in this case the gear hub, the chain attached to it changes and stays attached at a tangent however much you reduce or enlarge the hub. This way of working allows experiment with changes on one or more items on the rest of the drawing so that linkage movements can be studied. Complex and accurate drawings of objects can be produced and tried out to see if the elements work together. Finally the series of drawings can be animated to give a clear demonstration of the designed objects in action.

The package includes a substantial manual with a tutorial and appendices covering configurable options, filetypes, plotters and formula *for the advanced user who wants to set up functions for creating complex curves and so on.*

The options are very comprehensive and provide a professionally functional package. It's about five years since I used PDT but it still works as effectively as ever given the restrictions of the fixed screen.

It also goes much further in the area of simulation than any other packages I've seen. PDT has been fine tuned and developed over the past few years and costs £200 less than when I was first using it.

CNC Designer

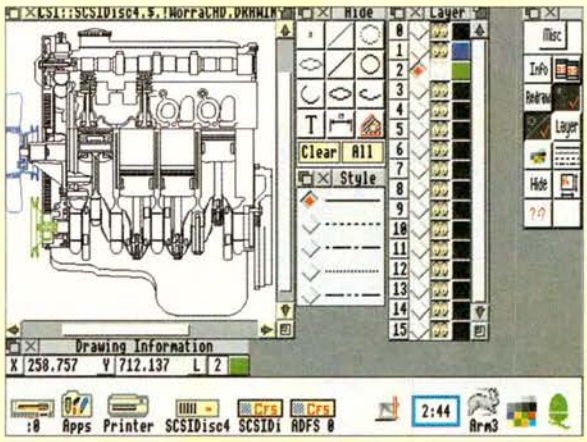
CNC Designer V3 is an integrated CAD/CAM – Computer aided design/computer aided manufacture – package for lathes and/or millers. Not only can you design an object on screen but you can also produce it on a lathe in soft steel or nylon or on a miller in brass, perspex, MDF and so on, extending the world of designing into the world of making.

CNC Designer includes, and is based on, the full draughting/design package Designer V3 and as supplied will work with one

WorraCAD

I hadn't seen the new version of WorraCAD but was pleasantly surprised to see that the claims in the adverts about it being so much easier to use seemed to be true.

Whereas PDT was designed for the professional market, WorraCAD was designed for the home and school market and is currently in its 22nd version which is considerably cheaper than the original and no longer uses a dongle.



WorraCAD can be a good starting package

There has been a continuous development of the program in terms of new features and improvements such as the addition of ellipses and elliptic arc geometry and a complete revision of the user interface to back up the Risc OS menus with graphic representations of groups of options such a printing, dimensioning to BS308, paper sizes and so on, forming the new icon-based menu system.

WorraCAD uses a floating point system rather than an integer model to represent data internally with the resultant improvement in drawing accuracy and size of drawing area. DXF files are supported and the drawing options include points, lines, circles, arcs, ellipses and text. There is a good selection of zoom options. Hard copy is via the HPGL plotter driver or Risc OS drivers.

The select menu includes hatching, mirroring, stretching, editing and transformation. The demo drawings are a clear indication of what you can expect from the package and the manual is clear and concise.

This is a good value for introductory CAD package capable of professional quality output.

individual lathe or miller though supplements for further or different lathes or millers are available.

It can extend and enhance the capabilities of the machines in respect to ellipses and bezier curves and the ability to use a multi-file format to allow complex components to be manufactured on all machines.

The basic functions for use with a lathe are as follows: G-Code program automatically generated from drawing data, works to a resolution of 0.01mm, angles less than or greater than 90 degrees can be generated on all lathes, elliptical and bezier curve profiles may be generated on all lathes, screwthreads can be internal or eternal, left or right-handed – where the lathe permits – drilling and boring supported.

Other areas covered are turret operation on most lathes, tailstock centre support for long components, parting off optional, coolant operation supported, 3D rotational view enables the turned component to be easily visualised before machining and which can be plotted or printed out, tool path simulation which allows the program to be test run before transferring to the appropriate lathe, full print-out of machining information, for example spindle speeds, tools used, billet details and so on.

The basic functions of the miller allow you to assign a tool position and depth of cut, to each of the pens used to create the drawing you are using as the basis of the milling operation.

Each tool position is assigned a tool type and size such as a 5mm slot drill, maximum depth per pass, feeds and speeds and so on, and with the multi-file format, complex components can be manufactured on all machines. These options extend the basic facilities of the basic CNC milling machine to incorporate the use of text, filled areas and imported clip art.

In other words, you can design complex objects beyond what seems to be the capabilities of the machine you're using, see them on screen as they would look when produced and simulate their production to make sure that the operation is carried out correctly and safely or to improve on your production techniques. This is a very powerful tool which shows why CAD/CAM should be part of as many pupils' and students' technology experience as possible.

Summing up

Determining which package you need depends on what you want to use it for. There's no point in buying the professional or senior version of a package if you just want basic facilities, especially as most companies have a clear upgrade policy which you can take advantage of when you need a more highly specified version.

There might seem to be no point in buying a professional package for a primary school but some of them are easy to operate even for young children and it's then a question of whether they need access to such sophisticated tools.

For design companies and industry using CAD packages the professional packages are probably ideal starting points but it's a good idea to discuss your requirements with a company who can advise you on an integrated approach to buying hardware as well as software if you need more than plotted or printed output.

The packages that seem to have the most going for them are CADet and ProCAD, especially as they make the most of the Risc OS operating environment when used with a high resolution monitor.

Areas of use

Program	Home	Primary	Secondary	Tertiary	Business
RiscCAD Junior	Yes	No	Yes	Yes	No
RiscCAD Professional	No	Yes	Yes	Yes	Yes
Perspectives	Yes	Possible	Yes	Yes	Possible
ProCAD	Possible	No	Yes	Yes	Yes
CADet	Yes	Possible	Yes	Yes	Possible
SPEX	Yes	Yes	Yes	Possible	Possible
Designer	Yes	Possible	Yes	Yes	Yes
CNC Designer	Possible	No	Yes	Yes	Yes
PDT	Possible	No	Yes	Yes	Yes
WorraCAD	Yes	Possible	Yes	Yes	Possible

PRODUCT SPOTLIGHT

Product: ProCAD
Price £495
Product: CADet
Price: £149
Supplier: Minerva Software, Minerva House, Baring Crescent, Exeter EX1 1TL.
Tel: 0392 437756

Product: PDT
Price: £199.95
Product: WorraCAD
Price: £99.95 (Upgrade from original £30.00)
Supplier: Oak Solutions, Suite 25, Robin Enterprise Centre, Leeds Road, Idle, West Yorkshire BD10 9TE.
Tel: 0274 620423

Product: Perspectives
Price: £45
Product: Designer V3
Price: £195
Product: CNC Designer V3 – for lathe OR miller
Price: £345
Product: Designer Intro (Risc OS 2 only)
Price: £75
Supplier: Techsoft, Old School Lane, Errynys, Mold, Clwyd CH7 4DA.
Tel: 0824 3318

Product: RiscCAD Junior
Price: £80
Product: RiscCAD Professional
Price: £130
Supplier: Davyn Software, The 'Workshop' off Princess Street, Sandal, Wakefield, West Yorkshire WF1 5NY.
Tel: 0924 254800

Product: SPEX
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The short list

Geoff Brown takes a look at two unusual and useful programs

QuickShow: Improving your presentations

QUICKSHOW lets you combine text and sprites into effective screen pictures for titling, demonstrations and so on. It can produce frames in 256 colours, using any outline font you have available, plus rectangles (hollow or filled) and sprites.

You create a frame by adding each item to the frame's object list, defining its appearance and general location. You can then check your results in *Show* mode with the frame picture on screen.

This also lets you use the mouse to move each object to where you want it. So creating a frame can be a simple or complex task depending on how you want the finished results to look. You get a lot of options for text, including font, size and colour, as well as shadow, underline and rubout. Rectangles, useful for borders, can also be any colour. Spritefiles – in Mode 15– can be imported from other applications as required.

QuickShow
Underlined Text
Underline colour/size can be different to text
Text with rubout box
Rubout box colour/size can be different to text

You can save a frame's object list as a scriptfile for editing or save the final frame result as a sprite file that can be used by other applications. QuickShow also includes its own Sequencer application that can display up to 40 frames in turn and fade from one to the next. To run QuickShow you really need at least 2Mb of memory plus a hard disk.

It would be nice to do all the editing with the frame on screen, instead of cutting back and forth to the object list to create a new item. Plus, the movement of objects on screen, while not difficult, is a little different from the traditional select and drag operation.

That said, this is a flexible program that is easy enough to use and can produce some very nice looking results at a very agreeable price.

PRODUCT SPOTLIGHT

Price: £25
Supplier: Desktop Projects Ltd., Unit 2A, Heapriding Business Park, Ford Street, Stockport SK3 0BT
Tel: 061 474 0778

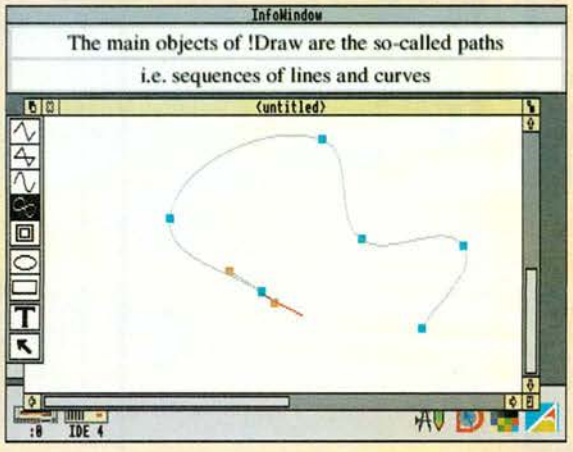
Mouse Recorder: Follow your leader again and again

MOUSE Recorder records mouse movements, clicks, key presses and so on, and then plays them back later. That is, it gets your machine to do the recorded things again, including running applications and using their facilities.

The program is subtitled Demo Development Pack and it is intended for use at exhibitions and so forth, where it can provide an automatic demonstration of a program. This can be accompanied by explanatory text, two lines at a time, in a special window at the top of the screen.

Recording is done via the application, MouseRec, and replay is via another application, either MouseRep (the full version) or Mouse Demo – a cut-down version that you are allowed to copy and distribute if you have MouseRep.

A number of additional facilities give you more control over the recording. You can have a demo repeat endlessly or chain several demos to run in sequence. It is even possible to edit directly the recording of a demo in the Mouse Recorder's own programming language. This last facility is complex and only for the technically minded.



A problem with programs of this sort is that the windows and menus you use in recording must open in the same places during replay.

Mouse Recorder gets around this by having you copy all necessary applications, plus !System and !Fonts (if needed) to the directory that holds the demo. You then start from an empty desktop and use these versions only.

Despite its flexibility and some nice features, Mouse Recorder has problems in terms of ease of use: It doesn't have a very friendly or elegant interface for the average user.

If you have experience in programming and know how Risc OS operates this shouldn't be a problem but the average user may find using the program rather technical.

PRODUCT SPOTLIGHT

Price: £25
Supplier: Klein Computers, Hasslocherstr 73, D-6090, Ruesselsheim, Germany.
Tel: +49 6142 81131

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Don't look a gift horse in the mouth

Teri Paul looks at a selection of deceptively simple PD programs

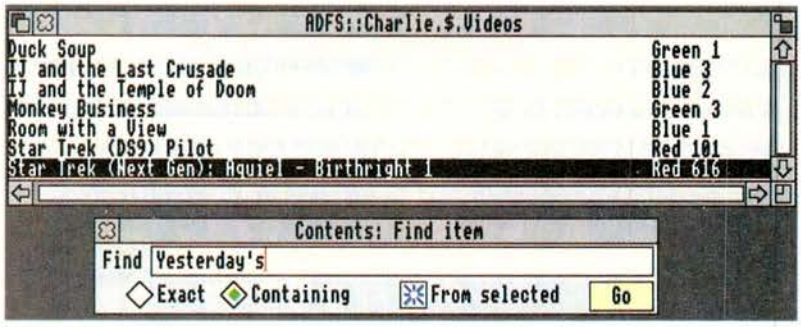
AFTER a while PD programmers seem to fall into categories of expertise. Some concentrate on music, some graphics, others release incredibly useful but specific programming aids, while a few have decided to make it so easy to organise your files that it would be a crime not too.

Ben Summers falls into the *I'm-going-to-get-you-organised-come-what-may* category with both his commercial and PD programs. And as he has converted me I don't see why you should get away with sloppy desktops and lost files – enter **Contents**.

You now have no excuse for not finding things whether they be physical paperwork, disks or your video collection. The catalogue is based around red, green and blue sticky labels and a number. You enter a new item and give it a name, colour and number.

For instance, *Gone With The Wind*, I label with a blue sticker and the number 004. These details are put into the Contents list where they can be edited later if you want.

You can search the file for an exact match or part of an item and start the search at any place in the file or if you prefer you can save the catalogue in Edit format. It's quick to use and I have catalogued my PD disks as well as videos this way.


ADFS::Charlie.$.Videos
Duck Soup Green 1
IJ and the Last Crusade Blue 3
IJ and the Temple of Doom Blue 2
Monkey Business Green 3
Room with a View Blue 1
Star Trek (DS9) Pilot Red 101
Star Trek (Next Gen): Aquiel - Birthright 1 Red 616
Contents: Find item
Find Yesterday's
Exact
Containing
From selected
Go

● *Contents: A neat way to catalogue a host of things*

Presentation is all

For facts and figures in graphical format, take a look at Chris Johnson's **ChartDraw**. This fully multi-tasking application has been around a while and allows you to produce a range of charts from data that can be entered and edited.

The program plots line graphs, stacked and grouped bar charts as well as pie graphs in two dimensions. You start with a window where you enter your data as well as labels for the axes, titles and sub titles. You can also load TSV, CSV or Ascii files, setting the options from the iconbar menu.

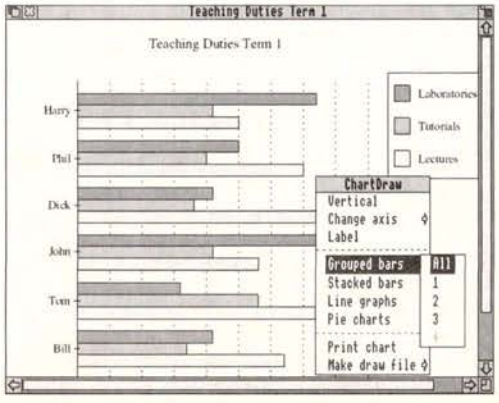
The commands and functions are standard Risc OS ones which makes it easy to use and once the data is entered you decide on which chart you want and whether you want all or some of the data graphed. Once a chart has been drawn, clicking on its window with the Menu button will present a number of choices.

Some are common to all charts, others are specific. Axes can be changed, pie chart segments exploded plus you can toggle between vertical and horizontal bars. You can also add up to 10 *labels* of up to 40 characters to add notes to your graph. When you press Return this becomes a writable icon which can be dragged anywhere on the window.

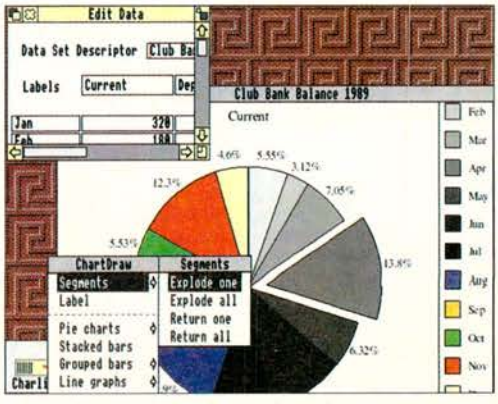
You can also add a border, filling the background with a solid colour and toggle between vertical and horizontal labels. ChartDraw is an excellent program with more flexibility than some commercial charting programs.

Staying with presentation but in a different vein is **!SlideShow** which has also been around for a couple of years and was written by John Kortink. Simply, it is a desktop player for sprites with you specifying the delays between each one. I did have some problems with Risc OS 3.10 but the program worked fine under Risc OS 2 and 3.

Sprite files can come from a range of sources: Scans, paint packages, grabs from commercial programs and digitised images. Your *slides* are first put in a directory with a file called !SlideInfo. This contains all the names of the sprites and the time delays for showing them. This is very simple to use and ideal for anyone new to the Acorn machines and to run your show you just drag ➤



● *ChartDraw: A deceptively simple charting program*



● *Making good use of its multi-tasking environment*

➤

the directory to the iconbar icon.

The Control icon accesses the usual cassette player buttons.

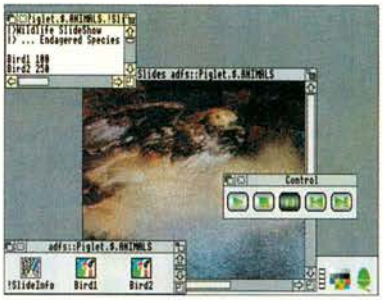
!SlideShow a very straightforward program which does a simple job with the minimum of fuss. A thing to look out for when using scans or selections of other people's images is the size of each sprite.

It's best to make these the same shape and size so you don't lose part of the image when the show is under way.

News, news, news

Demon Distribution are now selling their PD disks for £1 and have started a *Contact board* – a list of names and addresses of people from all over the world who want pen pals. If you're interested in finding out more, send a SSAE to Demon.

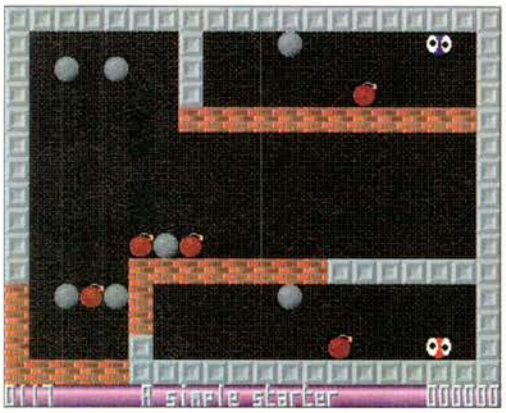
● *!SlideShow: A useful way to display a collection of photos...*



...or make a presentation on a theme

Digitech have two special offers running at present for anyone interested in fonts or who are new to the 32-bit machines. The **PD Font Pack** contains nine typefaces as a taster and if these and the automatic font installer have whet your appetite, £3.99 will buy you 20 faces exclusive to DigiTech. Their PD Starter Pack gives you two disks of programs for only £2.99.

Commercial stars Clares have released their **!Perform** program into the PD. This is used as a *player* for Rhapsody and Midi files and comes with the VoxBox suite. You can play up to 12 Rhapsody scores in sequence as well as access Midi files, Armadeus sound samples and voice modules.



● *Blots: Okay, you do better...*

8-bit knowhow

Those of you with access to 8-bit Acorns should take a look at the new programs available from JJF PD.

String Tracker is a music composition program which uses sampled sounds written by Lars Osterballe, and is reasonably intuitive to use. Samples and modules are available with String Tracker for you to experiment with and it is quite straightforward to create your own.

Adventure games are very few and far between on the 32-bit range so if this entertainment is your forte, dig out the old 8-bit BBC as there is a host of evil adventure writers ready and willing to throw down the gauntlet.

Over the years programs like the Quill and Incentive's Graphics Adventure Creator have spawned commercial and PD quests. **Timeballs** and **Insomnia** are two humorous ones which will keep you frustrated for some time.

I preferred Insomnia, though I am more familiar with Quill adventures. Remember if all else fails there's the **BAPS Adventure Creator** from Adrian Jackson which is a nice program to use and will introduce you to the art of adventure design.

Light relief

A nifty piece of shareware called **Blots** and written by Martin Bright, landed on my now tidy desk recently. To summarise there's you, a friend, some intransigent rocks and dangerous looking bombs.

All you have to do is explode the bombs by dropping boulders on to them to free yourself and your colleague. So will someone please explain to me why I invariably got squished? Come back Repton all is forgiven, but I must be able to get the Blot out of there somehow...

Blot is available for a £10 registration fee from Martin Bright, Van Middelhovenstraat, 264571 AD Axel, The Netherlands.

PD LIBRARIES

8-BIT HOUSES

8-bit Software, 1 Oakwood Drive, Heaton, Bolton BL1 5EE.
BBC PD,18 Carlton Close, Blackrod, Bolton BL6 5DL.
Elk PD, 5 Edward Street, Clifton, Brighouse, Yorkshire HG6 1QR.
Frisky Clams, 37 Cassiobury Drive, Watford, Herts WD1 3AA.
HeadFirst PD, 97 Chester Road, Southport PR9 7HH.
JJF PD, 49 Hollyberry Close, Winyates Green, Redditch, Worcester B98 0QT.
Mad Rabbit PD, 174 Duke Street, Southport, Merseyside PR8 5EL.
ScreenTeach, 21 Highlands Road, Rochdale, Lancashire.
The Wizard - BBC, Ryburn, Thorpe Lane, Cawood, Selby, North Yorkshire YO8 0SQ.
Welsh Boys PD, 88 Queen Street, Barry, South Glamorgan CF6 8EE.
The Yorkshire Boys, 40 Spotswood Place, Gleadless, Sheffield S14 1LE.

32-BIT HOUSES

3PD, 66E Picardy Road, Belvedere, Kent DA17 5QN.
Abyss Software, 35 Grantley Crescent, Kingswinford, Valley Fields, West Mids DY6 9EH.
Alpine PD, PO Box 25, Craigavon, BT63 5UT.
APDL, 39 Knighton Park Road, Sydenham, London SE26 5RN.
Amicorn PD, 11 The Square, Alveston, Bristol BS12 2PE.
Arcaynia, PO BOX 1927, Sutton Coldfield B74 3YZ.
ArchAngel, 9 Chancel Court, Chancel Lane, Pinhoe, Exeter EX4 8QE.
ARMistic, 136 Wellesley Road, Ilford, Essex IG1 4LJ.
Busy Bee Computers, PO Box 25, Ormskirk, Lancashire L39 3QR.
Craig Beech, 52 Margeholes, Carpendars Park, Watford, Herts WD1 5AR.
Datafile PD, 71 Anson Road, Locking, Weston-super-Mare, Avon BS24 7DQ.
DataStream, 34 Norbreck Close, Great Sankey, Warrington, Cheshire WA5 2SX.
Demon DPD, 3 Marshall Close, Fishtoft, Boston, Lincs PE21 0RX.
Diamond PD, 86 Meadowbank, Moor Lane, Holway, Holywell, Clwyd CH8 7EF.
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Different Ideas Music, 48 Merthyr Road, Dallington, Northants NN5 7BS.
Digital Illusions, 20 College Road, Wembley, Middlesex HA9 8RL.
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DoggySoft, 7 Blackhorse Crescent, Amersham, Bucks HP6 6HP.
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Matt Browne PD, 5 Inglefield, Pottres Bar, Herts EN6 1HD.
Moonlight Graphics – Shareware, PO Box 3569, Cape Town 8000, South Africa.
Naked PD, Fayence, Fulford Road, Fulford, Stoke-on-Trent ST11 9QT.
Ozone-Friendly PD, 180 Cumnor Hill, Oxford OX2 9PJ.
Power to the Programmers, 1st Floor, 23 Cooper Street, Nelson, Lancashire BB9 7XW.
RML PD, 24 Penryn Close, Norwich NR4 7LY.
Skyfall, PO Box 2220, Birmingham B43 5R2.
Spidersoft PD, 218 Saville Park Road, Halifax, West Yorkshire HX1 2XS.
The Demon DPD, 3 Marshall Close, Fishtoft, Boston, Lincs PE21 0RX
Westbourn Services, Westbourne House, 34 Bradley Street, Wooton-under-Edge GL12 6AR.

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X Window System R11.4

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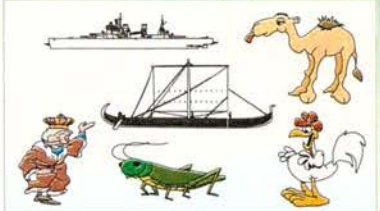

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DETAILS: This advert features DTP Packs, each pack consists of 3 to 4 discs. The software on them is a mix of both PD and copyright material, it will work on any Acorn RiscOs machine.

CATALOGUE: Skyfalls full catalogue and demo disc of Public Domain software is available for just £1.

Skyfall

PO Box 2220, Birmingham, B43 5RZ. 021 358 7078.

Let's keep on Tra

IT'S all very nice having a synthesiser or two, but you don't need any external equipment to produce music on the Archimedes. You can create some very sophisticated arrangements using a Tracker program. In fact, you can do things with Tracker which you can't do with a conventional synthesiser.

It uses samples so you can include vocals in your music and break beats – complete drum riffs – because you're not limited by the sonic architecture of a synth. If a sound exists you can sample it and use it although, of course, you need a sampler for that.

We'll look at the art of sampling later in the series but there are already so many samples out there in PD land and in demos that a hardware sampler is by no means essential.

Since The Serial Port released Tracker over two years ago it has become the accepted program for creating demos. It is also used to create soundtracks for games.

Other Tracker variants have appeared including Digital Symphony and Desktop Tracker which were reviewed in our May issue.

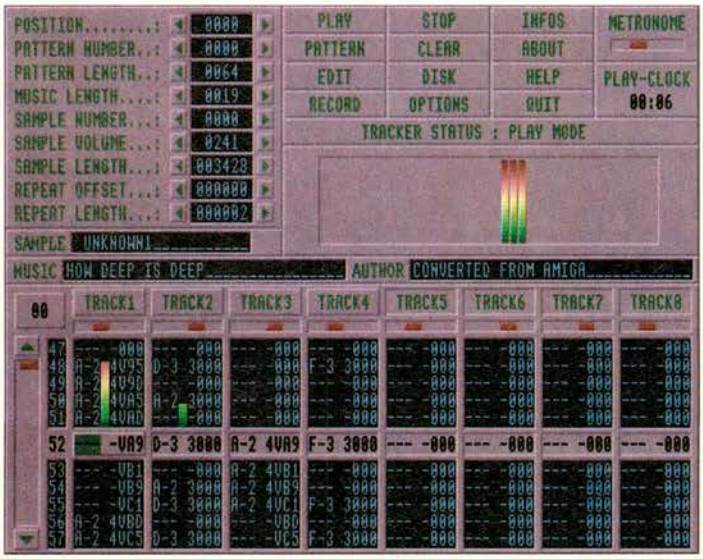
The basic principle behind all Tracker programs is the same. A song is produced by creating several patterns and linking them together. Patterns are created by entering samples in an event list.

As well as simply triggering samples, Tracker programs have a wide range of effects – some have more than others. These include portamento, vibrato, tremolo, phasing and volume slides to name but a few.

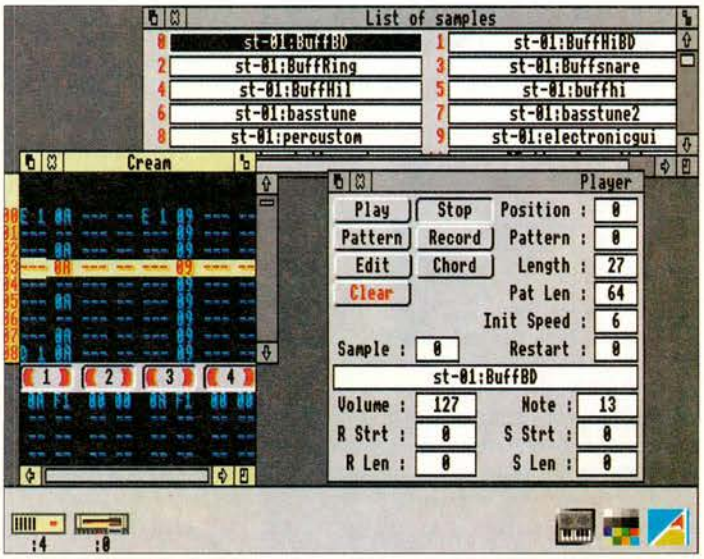
I'll be using Desktop Tracker in these articles as it has more features than Tracker and I prefer working in the Risc OS environment. You could well use Digital Symphony or Tracker itself. The basic principles discussed – other than the setting up procedure – apply to all Tracker-type programs.

Setting up

There are two or three windows you'll want on-screen most of the time – the editor, play window and sample list. These will fit quite well on to a Mode 12 display. This



● *You can use a Tracker...*



...or a Desktop Tracker

ckin'

Ian Waugh continues his series on music without the need of any additional hardware

ensures a large edit window so it's easy to see the notes and data you enter.

Select the Options menu from the icon on the menu bar and experiment with the edit window colours. The default ones are okay but you may have different preferences and while you're there, check the options in the Convenience section. This will help you work much faster. I use the following settings:

- Space scrolls: On
- Note deletes FX: Off
- Play when scroll: On
- Increment sample: On when first loading a block of samples then Off so I can easily replace individual samples.
- Numbers move cursor: On

You can set the number of voices you wish to use. This will limit the size of the edit window and you can always increase it later.

There are many ways to approach the production of a piece of music and you'll no doubt soon discover a method which suits you best. The most common approach is to lay down the rhythm track first. Some arrangers then add melody followed by the backing track, others do it the other way around. Lastly, you add the toppings or sweeteners.

Track creation

Now, let's be creative. The first step is to work out a time frame to see how long the shortest notes need to be. It's not necessary to read music to do this although it will help. Of course, if you're composing a piece of music from scratch you may not know how long the shortest notes will be, so you'll have to make an educated guess.

As a rule of thumb, I suggest making each step in the pattern a 16th note although if you're sure there aren't going to be any long notes in the pattern you could make them eighths.

However, as we're working with relatively small phrases – probably only two to four bars long – a wrong guess isn't going to take too long to redo.

Let's say you're going to create a drum track. Load some drum samples you think may be useful. You can audition the samples in Desktop Tracker by selecting them in the Sample List window and playing the Arc's keyboard.

Work out a short pattern involving a bass and snare drum. I've created a two-bar Hip Hop ➤

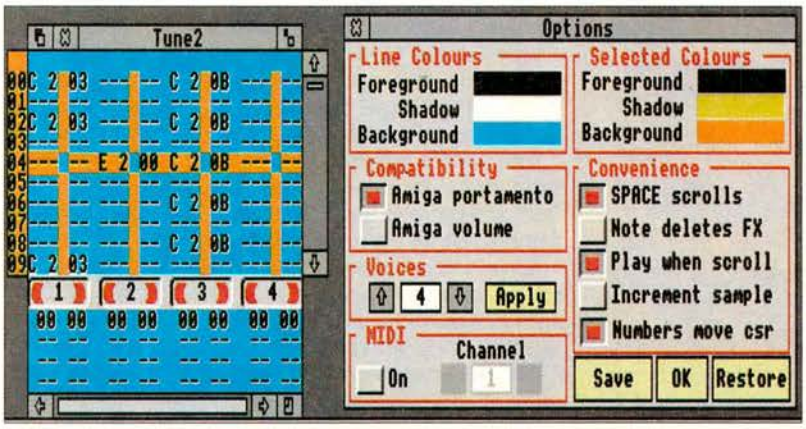
Tracker note format

Each entry in the editor's event list has two parameters – note name and sample number. The notes appear as a note name and octave number and the range in Desktop Tracker runs from C 1 to B 3. The correct pitch is entered automatically if you are in Edit mode and press a key on the Arc keyboard.

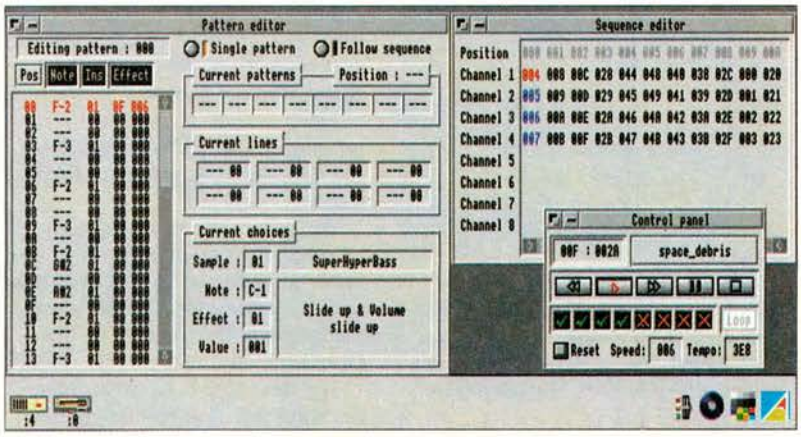
The sample number is also entered automatically when you press a key. This is the currently-selected sample and is in hex. This means each note in a track can play using a different sample.

Here are some examples:

C 1 00	The note C in the first octave played with sample 0
D#2 10	The note D# in the second octave played with sample 16 – which is 10 in hex



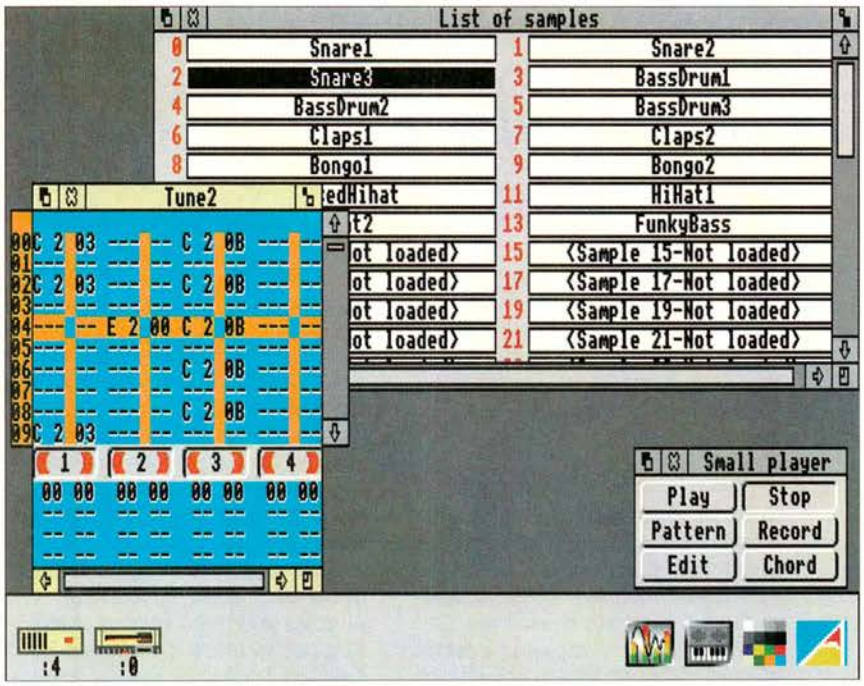
...or Digital Symphony to create impressive sample-based music on the Archimedes



● *Use the Options menu to customise the program's colours and settings*

```
Track 1 = Bass Drum
Track 2 = Snare
Track 3 = Hi Hat
00 C203——C20B
01 ——————
02 C203——C20B
03 ——————
04 ——E200C20B
05 ——————
06 ————C20B
07 ——————
08 ————C20B
09 C203——
0A C203——C20B
0B C203——
0C ——E200C20B
0D ——————
0E ————C20B
0F ——————
10 C203——C20B
11 C203——
12 ————C20B
13 C203——
14 ——E200C20B
15 ——————
16 ————C20B
17 ——————
18 ————C20B
19 C203——
1A C203——C20B
1B ——————
1C ——E200C20B
1D ——————
1E ————C20B
1F ——————
```

● *A two-bar Hip Hop drum pattern*



● *This is a short pattern created using the drum examples from the last article*

➤

pattern based on the drum pattern examples given in the last article. Using a time frame of 16th notes means the pattern length must be set to 32.

The numbers down the left are the event numbers in hex format, the traditional Tracker way of numbering. However, in Desktop Tracker, the Sample List uses decimal numbers, not hex.

The sample numbers in the example are those which sound best from the samples loaded into my Sample List. The sample numbers you use will be different. When you select a sample, Tracker automatically inserts the correct number along with the note.

The note numbers are simply the pitch at which the drums sound best, too, and have nothing to do with a musical scale. Try playing each drum at various pitches to get the best sound.

```
00 E20D    0B D20D    16
01 E20D    0C E20D    17
02 E20D    0D         18
03 E20D    0E         19
04 F20D    0F         1A
05         10         1B
06         11         1C
07         12         1D
08         13         1E
09 D20D    14 C20E    1F
0A         15
```

● *The Bass line plus Yeow! The bass uses sample 0D and the Yeow! uses 0E. The pitch of the Yeow! does not have to fit in with any musical scale, it's just the pitch at which the sample sounds right*

	No of patts	No of events/patts	No of song positions	No of samples	No of tracks
Tracker	64	64	128	36	8
Digital Symphony	4096	64	4096	15-62*	8
Desktop Tracker	256	256	4096	63	16

** 15 or 31 for Amiga ProTracker, 36 for Tracker and 62 for Symphony files*

Hey, Mr Bass Man

Using this as a our basic rhythm we can now add a bass line. First, copy this pattern to another pattern so you have a drum-only pattern you can use as a template.

And you must save your work regularly. I use a system of incremental letters and numbers – Tune1a, Tune1b, Tune1c, Tune2a, Tune2b and so on. The numbers represent a major modification such as the addition of a new pattern or changes to the samples.

Tidy up your disks after a programming session to get rid of old files – or keep plenty of floppies handy.

You can create more patterns adding a melody line and/or some more vocal hooks. If you need more tracks – in Desktop Tracker – you can increase the number in the Options menu.

The next step is to enter them in the song list. This is the easy bit although if you have lots of patterns it's a good idea to scribble down what they are on a piece of paper.

Scroll to song position 0 and then scroll to the pattern number you want to play first. Then scroll to song position 1 and select the pattern you want to play next.

The only thing you need to watch is that you don't scroll the pattern before you scroll the song position.

● *Next month there's more about making music with Tracker including some hints on entering a score from sheet music.*

Tracker features

The original Tracker may seem more limited in comparison with the latest programs but the vast majority of tunes only use a small number of patterns and song positions. The more samples you use, the more ram you need to play the tune and the more disk space to save it. Operationally, however, it's nice to use the Arc's desktop interface – and the original won't work with Risc OS 3.10.

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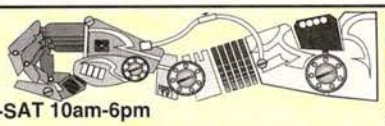

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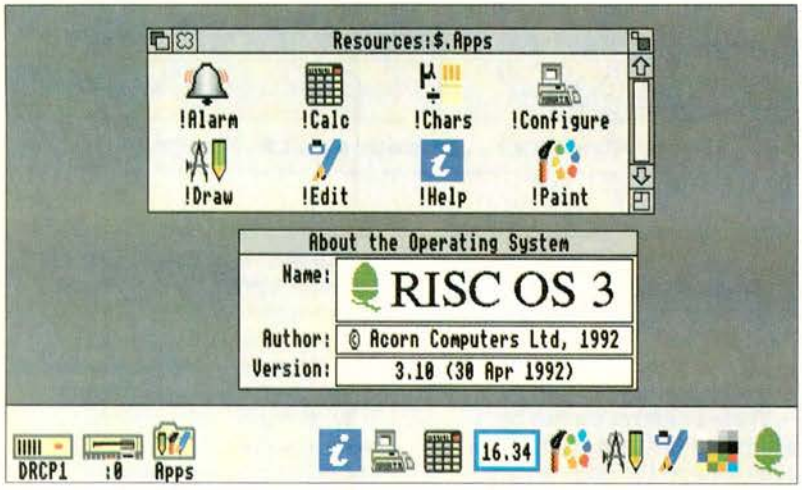
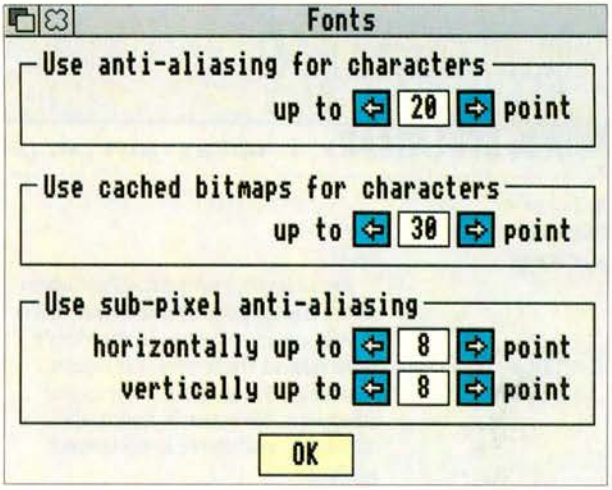


● *The applications built into the new operating system roms*



● *Configuring your fonts for a nice-looking screen*

Make the change

Geoff Gallacher takes another step into the world of Risc OS 3

IN my previous article in the April issue, I covered the various options available for upgrading your machine to Risc OS 3.10 and how to fit it to your particular machine.

In this article I will cover some of the software problems you are likely to encounter and their solutions and also provide a list of some of third-party applications which have certain problems or require upgrading or updating by the manufacturers.

Once the Risc OS 3 upgrade roms are installed, you will need to remove all the Acorn-supplied applications (such as Edit and Draw) from your hard disk or your working disks. Make a backup if you don't have the originals.

Copy the new Risc OS 3 applications to your hard disk or make working copies for your daily use. Put the original disks away for safe keeping, in case you need them at some later date.

The files you should keep are any relocatable modules which are in the Risc OS 2 or 3 !System.Modules directory – which might be important to some of your other applications – and your !Fonts sub-directories.

The first problem which you will come across will be the !Fonts directory. Acorn have changed the way that the !Fonts application works and the old Font manager will not work with Risc OS 3. This does not mean that all your Risc OS 2.00 fonts will not work, only that the program part of the !Fonts doesn't.

Using the Filer menu rename the old !Fonts to just Fonts (no !). It will turn into an ordinary looking directory. Copy over the new !Fonts then Shift+double-click to open it up. Open the Fonts directory as well and Shift+drag the actual font directories themselves across. This moves the fonts from one directory to the other. Now delete the old Fonts completely.

Another major change to the new operating system !Fonts, is that Trinity,Corpus and Homerton fonts are now in rom and therefore do not have to be on disk. So if you have these on your disk, they can be deleted.

More than one !Fonts directory

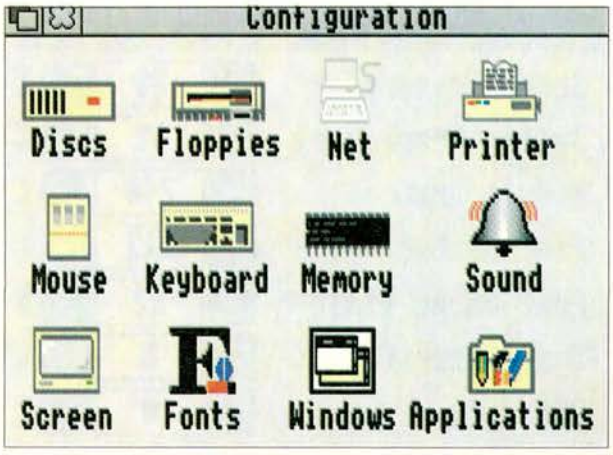
Risc OS 3.10 also has the facility to have more than one !Fonts directory in which it can search for the fonts. The path of each new font directory is added to a system variable called *Font$Path(Macro)* and you can view this by pressing F12 and typing:

```
Show Font$Path
```

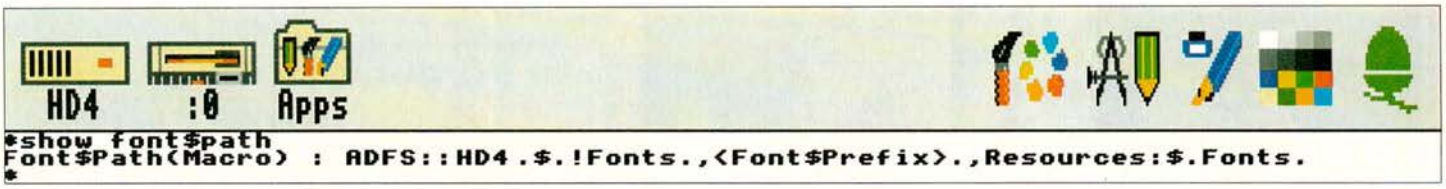
then pressing Return. This will list the variable on screen and show you where Risc OS thinks all the fonts are being held. Every time a new !Fonts directory is seen by the Filer it is added to this variable.

With the upgrade kit you get some notes which will help you in converting your !Fonts directories if you are running a network with a mix of Risc OS 2 and Risc OS 3 machines. These need to be fully understood and implemented and this is best done before the system is brought back on-line after installing 3.10 roms in the server.

The !Configure Application, which is now in rom – click on the Apps icon – is much friendlier about configuring the Fonts and associated memory allocation than the Risc OS 2 version. You can now choose what level of anti-aliasing you want, what point size of the maximum font you want to be cached, and what level of sub-pixellation you require without ever having to go near the command ➤



● *The configuration sections that can be altered*



● *See what font directories you have*

➤

line.

Anti-aliasing and sub-pixellation affect the quality of the fonts when drawn on the screen. If you don't understand these terms it doesn't matter as the default settings are adequate. Everyone's needs are different, and there is no correct setting.

Software compatibility

Now, let's take a look at the sticky problem of software compatibility, as this will probably be the item of most interest to you. Let's face it, the hardware is only the starting point of a computer system. It is the software that makes the difference and makes the machine do what we want it to do – or at least what we think we want it to do.

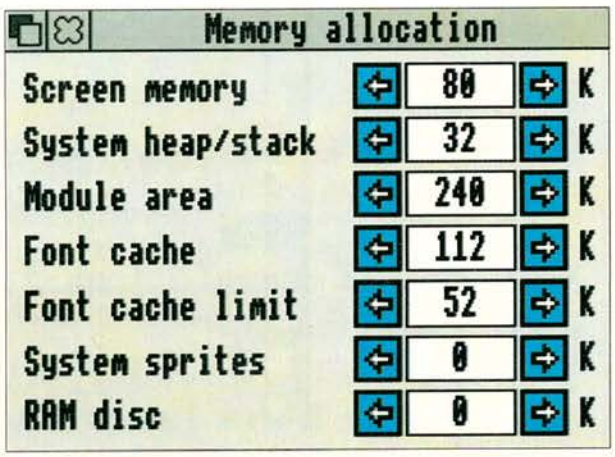
As many software packages are in the marketplace today, it would be impossible to cover them all in detail, but basically I want to group them into possible trouble areas.

The first of these are programs which either create fonts, alter existing fonts or distort their characteristics. These programs may not perform correctly with Risc OS 3.10 Fonts. It's worth noting that quite a lot of the functions which these programs gave to Risc OS 2 are now included as standard in Risc OS 3.10, for example rotating fonts or converting them to draw paths instead of text.

The second area of concern is with programs which assume that certain modules act in a certain way, usually undocumented, and these may have changed, thus rendering the program incapable of operating correctly. Most of these are vintage Public Domain programs, and it is worth checking with the PD house to see if they have checked the program is RO3.10 compatible or if there is an upgrade available.

These problems cannot be attributed to Acorn, as they can only support the documented features and any problems you experience you should take back to the person or company that wrote the code.

● *Allocating memory for the machine*



Killer games

The third area is games, because these are so demanding on the facilities of the machines and some of them used to do some really nasty things to the system to gain more free space in a 1Mb machine. These are known in the trade as a *kick-the-relocatable-modules-in-the-teeth-programs* and literally would RMKill any modules they did not require, and also re-configure the memory parameters to a minimum.

Classic examples of this are RMKilling the Font manager and reducing all other services to their minimum values. The most reckless of these are programs which include RMClear and RMTidy commands in their !Run files. These will almost invariably fail in Risc OS 3.10.

This compatibility problem will exist mainly with the older games, written before the A5000 was released and the first version of Risc OS 3 with it.

Mainstream applications, such as !Impression, have been updated and a new releases are available. This is a service provided for users and is not mandatory – please remember this when you speak to the company to get your upgrades.

Some companies are providing their upgrades at a small cost, usually to cover the administration and postage charges. All in all, Acorn computer users get a much better deal than PC users, where upgrades are concerned. It is not unknown in the PC world for vendors to say you must buy the new version at anything up to £400.

All new applications, written after the release of 3.10 should not suffer from any of these problems. If in doubt, ask the supplier, or manufacturer if it is 3.10 compatible. It is probably best to buy your software from reputable Acorn-approved dealers, as they will have up-to-date information on product releases and can usually show you the package running.

With respect to upgrading your existing software, a nice telephone call or letter to the company concerned is bound to get better results than a *Mr.Angry from Leeds* type of communication. Even worse than that, is complaining to all your fellow users or prospective Acorn computer users about incompatibility problems, when you haven't even inquired about upgrades or updates.

Although I have been looking at the down side of upgrading: Compatibility, installation and program conversion/patching, there are far more advantages to installing Risc OS 3.10 into your machine.

New features

Here are a couple of quick examples of some of the new features. Get a !Draw file on screen and go to the scroll bar at the bottom of the window. Using the Adjust button grab the scroll bar and move it around. Looks the same as using Select, doesn't it?

Now move the mouse up and down – this moves the vertical scroll bar as well. This is a nice touch and certainly improves the act of moving from the top corner of a window to the bottom corner (or anywhere in between). This will work with all windows with scroll bars, and really helps if the bottom edge or right edge of your window is off the screen.

Now, expand the window to the full size of the screen using the size toggle Icon in the top right corner of the window. Next, open the Apps directory – kind of difficult without moving the full screen window?

Well you can simply press Shift+f12 and the iconbar will jump to the front, allowing access to the applications on the bar. Pressing Shift+f12 again will send the bar behind the window again. Yet another very useful little feature.

● *Bet you can't wait for the next part now ... but you'll have to, see you next month.*

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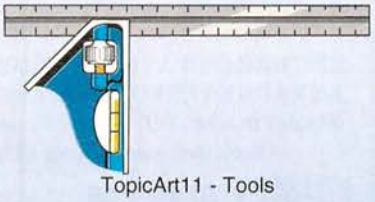

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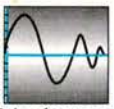

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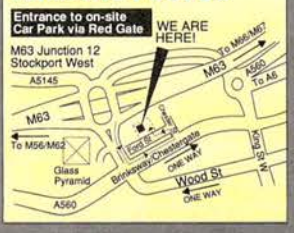

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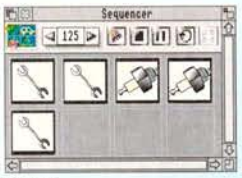

The composition can be played using Archimedes sounds or through a MIDI instrument.

The Compose World disc contains a wide selection of phrase sets which cover different styles, themes and structures.

Pictures can be edited and created with the in-built picture editor.

Pictures can be any Risc-OS sprite, as generated by the !Paint application.

In addition to phrases being given an icon and name, they can also be given a picture to display whilst the particular phrase plays. . .

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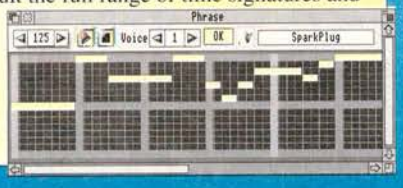

Special effects can be used to alter the phrase : transpose, stretch, invert etc.

Phrases can be saved and loaded as MIDI files.

ON REVIEW "It won't frighten teachers. There are no notes, just pictures and surely nobody is intimidated by a picture of a banana . . . . . Compose World is just wonderful" !
Alan Bennett : Archimedes World - April 93

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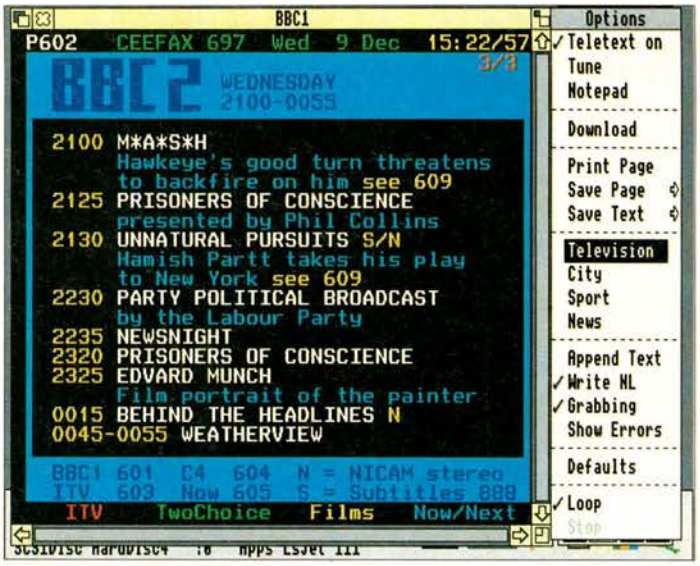
● *Extra keypad options with Ground Control's advanced software*



● *Capturing a pre-selected page*

A TELETEXT adapter is a piece of hardware that displays text data transmitted by the TV broadcasters, which is called teletext. Transmissions by the BBC are called Ceefax and those by independent broadcasters are currently in a state of flux.

Pages of topical information on various matters of interest are transmitted using hidden lines of normal television transmission. These carry synchronising information, but not actual pictures. Although originally only intended for TV synchronisation, in recent years, the broadcasters have used this spare capacity to transmit additional information.

Most people who receive teletext do so on their television. However, it is possible, and in some ways preferable, to receive it via your micro. Naturally, you have to connect the adapter to a TV aerial to receive teletext – and if you don't already have a TV licence you'll need one.

On screen delights

Clem Vogler takes a look at teletext, a neglected area of Acorn computing

Ground Control Universal

This comes in a neat metal case with an integral power supply and a permanently attached mains lead and plug. The power switch is at the back and a power-on indicator LED at the front.

There are three signal connection sockets at the front for aerial input and data and aux output. This makes for untidy cabling – I would have preferred these sockets to be at the back.

A data lead is supplied to connect the adapter's data socket to an expansion socket on the back of your machine. Ground Control have intelligently provided a rubber grommet on the lead so that you can make a neat job of fitting the cable through the blanking plate.

The aux socket can be connected by a 5-pin DIN to dual phono lead (not supplied, but widely available) to a suitable monitor which will enable you additionally to display broadcast sound and vision. You would need a monitor suited to 1V pp video and 600mV audio to do

➤

PRODUCT SPOTLIGHT

Product: Universal Teletext Adapter (Model UTA-3) and software
Price: Standard £119, Advanced £174, inc p&p excluding VAT. Upgrade standard to advanced £55. 20% discount for educational users. Volume sales discounts.
Supplier: Ground Control, Unit 7, Kingfisher Court, Hambridge Road, Newbury, Berkshire RG14 5SJ.
Tel: 0635 524008 or 0622 747416

Product: Morley Teletext Adapter
Price: £125 excluding p&p and VAT.
Supplier: Morley Electronics Ltd, Morley House, West Chirton, North Shields, Tyne & Wear, NE29 7TY
Tel: 091-257 6355

Product: MultiTTX (for Morley Teletext adapter)
Price: £24.95
Supplier: Really Good Software Company, 39 Carisbrooke Road, Harpenden, Herts, AL5 5QS
Tel: 0582 761395

● *Ground Control's ace advanced feature: Auto-capture of a predetermined sequence of pages*

● *Teletext page and associated textfile – ready for printing*

● *Page selection using standard Ground Control Keypad*

➤

this. The software is Risc OS-compliant, mouse-driven and easy to use. A tuning procedure automatically scans the broadcast spectrum and locks on to your local transmitter frequency and saves the settings. Fine manual tuning is provided, but I did not need it.

The teletext display window is not scalable, but you can display part of a window in the usual RISC-OS ways. In Mode 12 or 20 it occupies all the height and two thirds of the width of the screen. In my favourite wide Mode 102 I was able to write this article in an adjacent window to the full teletext display

Two versions of the software are available: Standard and advanced. With the standard software you select channel and page by clicking on a displayed numeric keypad. Inconveniently, you have to click on two buttons to change channels.

Some shortcuts are available: You can click on any three digit number in the teletext window, on fastext options, on index and last page options or on a customised menu of your choice of four pages. Although the fastext options set the page correctly, they don't access it any quicker.

Other features enable you to hold a page or reveal hidden data – used for quizzes. You can print out the text content of a page and save a page as a teletext file. There is also a facility for downloading teletext software – although none is being transmitted at present.

The advanced version of the software has all the features of the standard software and some useful additional ones. You can select channel and pages from the keyboard, provided the teletext window has the input focus. By this, I mean that the teletext window rather than some other window must be the one currently taking input from the keyboard. If it isn't, you click anywhere inside it to select it.

The advanced version implements true fastext, storing related pages in advance of selection in case you might want to view them. If you do and they have been stored, they display instantly. As a further refinement, the software highlights the icons of all currently stored related pages so you can see which are available for instant viewing.

Most useful of all, you can list in a simple text file a sequence of pages to be captured and stored automatically. There can be any number of pages from any combination of channels. You choose whether you want the pages stored as text or teletext files. You also choose to store each page under a separate filename or append pages to the end of a single file.

You can even arrange for the page storing sequence to repeat in an endless loop so that your file is updated in (almost) real time. In this way you can collect 20 or 30

	Morley	Morley & MultiTTX	Ground Control standard	Ground Control advanced
Hardware				
Size mm	250 x 155 x 55	250 x 155 x 55	205 x 135 x 70	205 x 135 x 70
Power Supply	external	external	internal	internal
Connector sockets	rear	rear	front	front
Connector for broadcast monitor	no	no	yes	yes
Software				
Multitasking	no	yes	yes	yes
Data entry	keyboard	mouse & kboard	mouse	mouse & kboard
True fastext	no	no	no	yes
Use fastext menu	yes	yes	yes	yes
Number of presses to:				
Change channel	1	1	2	2, often 1
Enter new page	3, sometimes 1	3, sometimes 1	3, often 1	3, often 1
Shortcut to index page	yes	yes	yes	yes
Hold/release	yes	yes	yes	yes
Reveal	yes	yes	yes	yes
Specify subpage	yes	no	no	yes
Printer dump as text	yes	yes	yes	yes
Save page	TText file	TText or textfile	TText file	TText or textfile
Access last ten pages	no	yes	no	no
Append saved pages	no	no	no	yes
Update system clock	no	yes	no	no
Access operating system	yes	yes	yes	yes
Download teletext software	?	?	yes	yes
Autosave a selection of pages	no	no	no	yes
Saved pages readable by Shareholder	yes	yes	yes	yes

● *Teletext graphics displayed in a window*

● *Ground Control's automatic station tuning*

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● *Full screen display with the Morley screen*

pages of financial data in the background. Drop the file on to your financial package, print out the update and your boss will be amazed at how industrious you are.

Morley Electronics

The Morley teletext adapter comes in a rigid plastic box with a solitary LED power light at the front. At the back is an aerial socket and a ribbon lead which splits to terminate in an expansion socket connector and one of those funny six-way power connectors you used to use to connect an unpowered floppy disk drive to a BBC Micro.

This you connect to a short length of flex which you in turn connect to a 12 volt regulated power supply module (included) with three-pin plug attached ... which you plug into the mains.

Astonishingly, this does not cause the LED to light up, since this takes its power from the machine. The LED thus tells you little about the power status of the adapter. Since there isn't even an on/off switch, this may be just as well. It looks as messy as it sounds, but it does work.

The software looks a bit elderly and doesn't multitask. It takes over the whole screen and isn't mouse-driven. Once you accept this limitation, it works pretty well. It sets up the function keys to do useful things like channel select, fastext option select, hold, reveal, index page, loading, saving and printer dumping.

Tuning is done manually. You have to run through quite a lot of key presses if you don't know your local channel numbers, since the tuning increments are small. But the end result is satisfactory and once you have saved the settings you won't need to tune again.

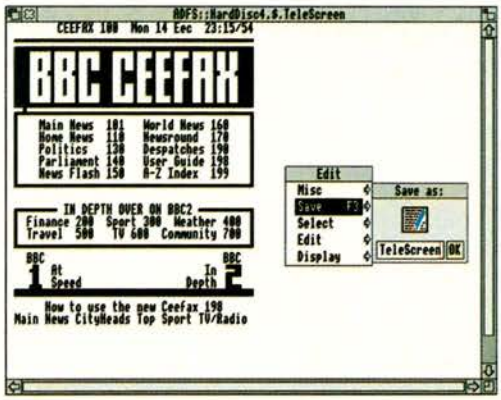
The Morley software accepts page numbers entered from the numeric keyboard. I thought this was easier than the mouse-driven keypad of the Ground Control Standard software and easier than using the remote control of a television.

Hybrids are possible: You can use both versions of the Ground Control software with the Morley adapter, but not vice versa. You can also obtain a package called MultiTTX from The Really Good Software Company which makes the Morley display multitask.

It provides a choice of mouse or numeric key entry and is the only mouse supporting package to implement channel changing by the obvious means of four buttons labelled BBC1, BBC2, ITV, Ch4. It has a couple of useful features: A 10-page memory of previously viewed pages and a neat facility to set the system clock from the teletext clock.

● *Multitasking display using Morley hardware with MultiTTX software*

● *Printable telescreen, using MultiTTX*

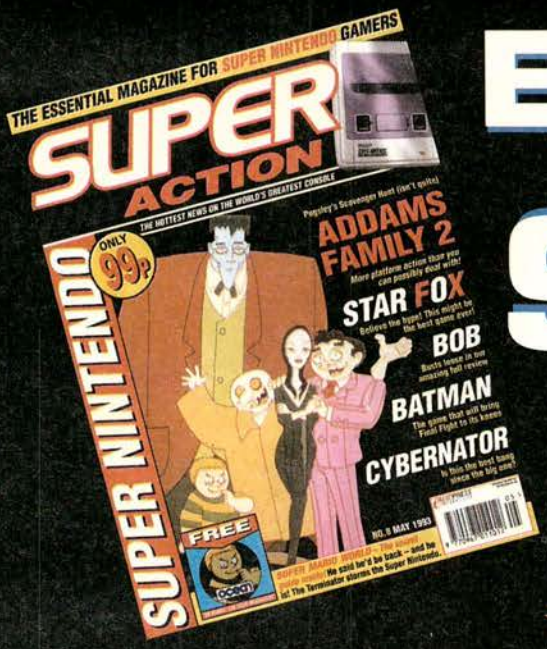


Summing up

Both products give good teletext displays if fed from a TV reception-quality signal. They all offer advantages over television-based systems in enabling you to save teletext data and produce hard copy of pages.

The Ground Control hardware is neater and its software has the advantage of multitasking with other applications. I preferred entering pages from the numeric keyboard. As a data source for software which can read teletext files, (like Silicon Vision's Shareholder III), all will work, but the multitasking packages are quicker as you can run both applications in adjacent windows and drop teletext pages onto the target application without intermediate saving to disc.

MultiTTX is a definite improvement on the Morley software. Its modest price represents good upgrade value if you already have the Morley hardware. Ground Control's Advanced package offers the neatest solution by collecting your pages into a single file. You could then arrange for an Obey file to automate the whole data update process.



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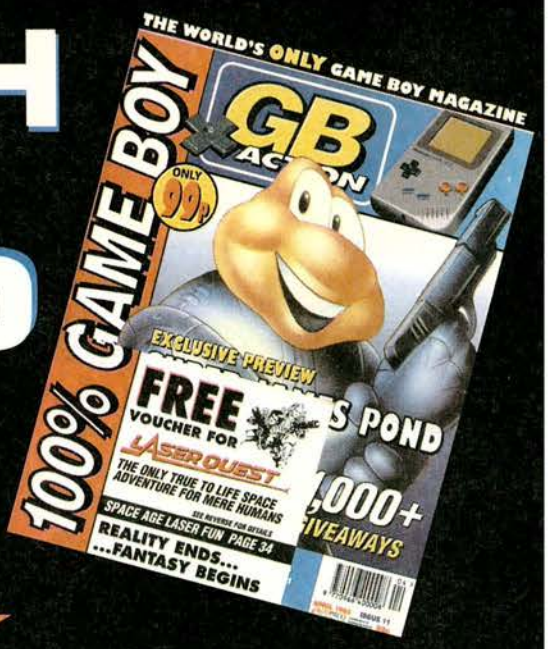

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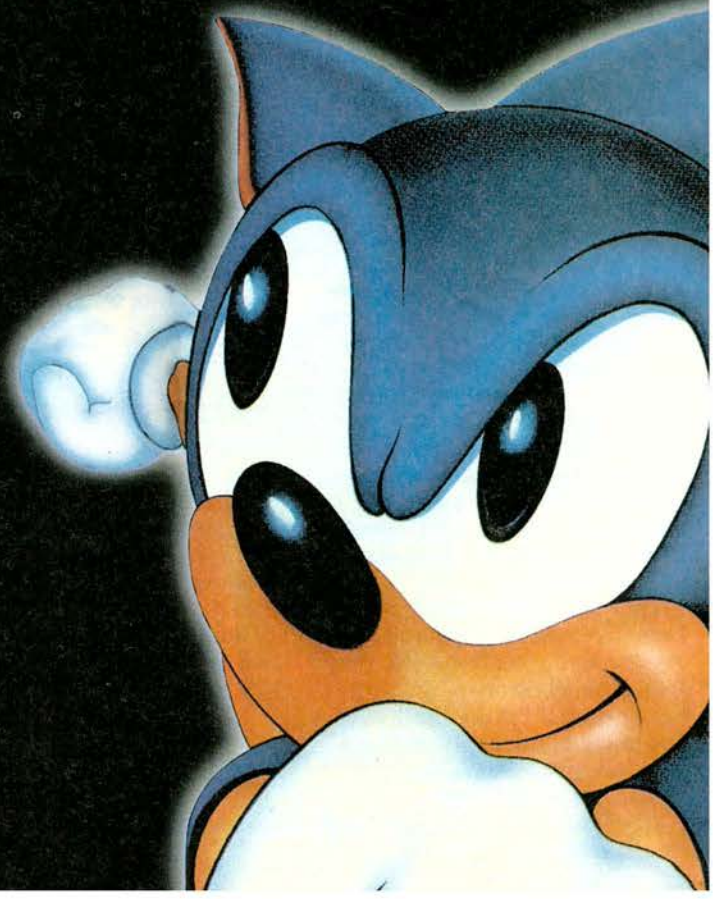

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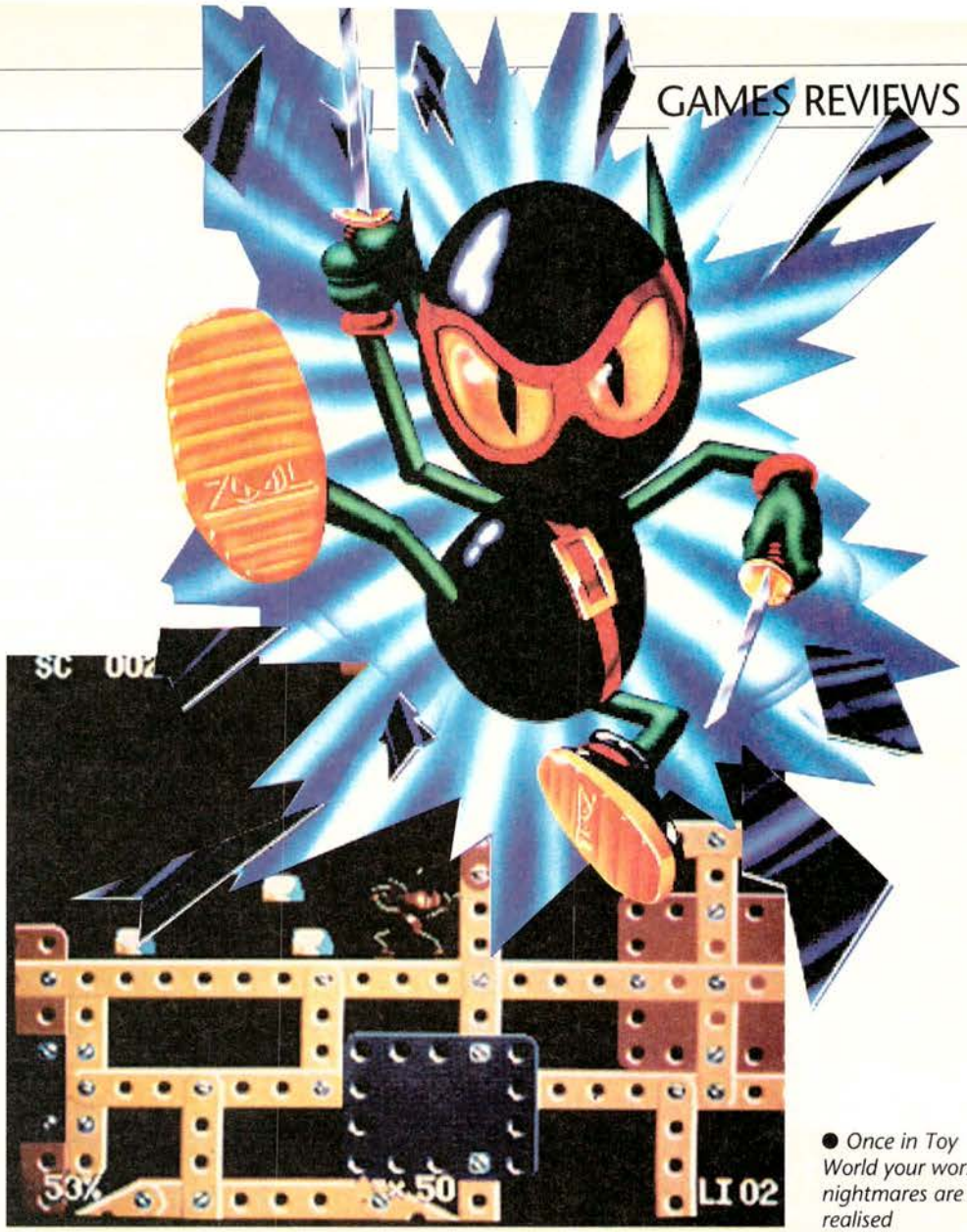
Zool

... martial arts?



● *Once in Toy World your worst nightmares are realised*

TRAPPED in a series of weird and wonderful worlds, Zool of the Nth dimension fights to prove himself worthy of the title of Intergalactic Ninja. Having been set a series of tests by a mysterious someone-or-other, he has to battle his way through six worlds, all of them strange, dangerous and not a little silly.

Cygnus of TwinWorld and Tower of Babel-fame programmed this Acorn conversion for Gremlin and it's a superior platform game that gives you a lot of variety and some unusual and ingenious perils.

Its hero is a short but dangerous little critter, a pointy-eared Ninja with a mean glare and a snappy line in swordwork. Gremlin's place in the 16-bit market is secured and their next potential 32-bit release – Premier Football Manager – depends on Zool's success in the Acorn market.

In the course of his adventures Zool meets up with jelly beasts, walking drums, flying chainsaws and many other strange and surreal forms of death and destruction.

The game has a definite cartoon-like ambience, one that runs through all the mayhem and the strange and wondrous beasties that appear. The instruction manual includes a little comic strip that sets up the situation and also gives you an idea of the intended style: *There I was on my way home after some heavy duty Ninja-ing...*

The basic procedures are the same as those in many another platform games.

You get to run and jump, punch and shoot bad guys, pick up objects for points, gather extra lives and work your way through all the hazards to the big nasty beasty at the end of the level. Then, if you survive, it's on to the next world and all the critters there. If you're very lucky you can even mess around on a bonus level.

Zool features high-quality graphics with fast and fluid movement. The hero runs, jumps, slides, crouches and fights in a varied manner and with a definite style. He can punch things or shoot them near or far and can leap to deal with flying enemies.

Combat is fast and furious with a lot of different beasties that attack in different ways. Zool's best fighting move is a spectacular sort of leaping spin, sword out, like a whirling dervish, or the Tasmanian Devil with sharp edges.

The six worlds through which Zool fights are detailed, varied and nothing if not strange. You get to see quite a bit of them if you ever make your way through to the end. At several points there are objects that can be punched to save your place in the game.

The first world is the Sweet World, a calorie-rich, carbohydrate landscape of candy canes, fruit drops and chocolate, where you fight shuffling fruit jelly beasts and giant bumble bees. This level offers some very strange scenery and the embarrassing possibility of being killed by a liquorice allsort.

Next up is the Music World, with a landscape largely built of wires and stereo systems. CDs, plugs and speakers abound and the first dangerous beasties are the marching drum kits. Then there are the violins with bows for arrows and the dangerous bits of unearthed equipment.

Fruit World follows, the land where ➤

● *The bees may be deadly but the liquorice allsorts mean business*

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➤
the vegetables strike back. Flying pea pods bomb you, while spitting carrots bar the way and a bunch of grapes is not likely to heal the sick. As I recall there was an episode of Lost in Space with the same theme but the effects are much better here.

Tool World is next and includes drills, swords and axe blades that pop out of the walls, plus flying chainsaws and curious little red robot thingies.

Toy World is where you get to meet militant teddy bears, dangerous spinning tops and paper planes on bombing runs. Don't trust the cute and furry critters and beware of the killer Meccano.

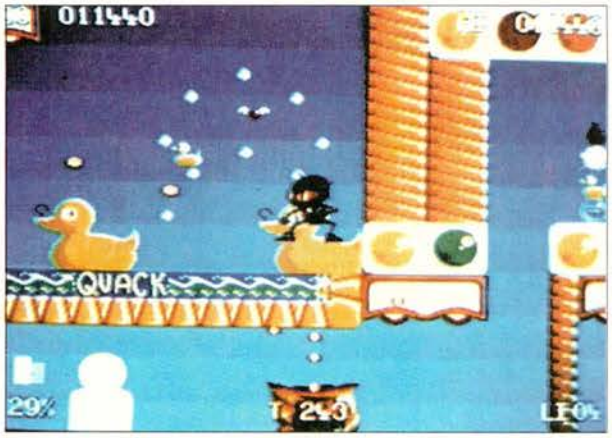
Finally there's Fairground World, a carnival land of old where the candy floss is bad for your health, the mutant toffee apples are on your trail and the popcorn pops a bit too vigorously. At the end you get to meet the Indescribable Two Eyed Thing, assuming you get that far.

All through the six worlds you have to pick up all the inanimate objects you can, so as to get the points you need to move on. Mind you, not all the objects around are really inanimate. As a general rule, if they move or give you a dirty look they're the bad guys.

Zool starts off with three lives to lose, but more are available when you zap some of the nasties. Some but not all of them (and it appears to be random) give off life force at the end in the form of a little heart. The heart wings its way skywards and you can catch it if you move fast enough.

All of this adds up to a fun game with a lot of variety and ingenuity, packaged with some slick and effective graphics and music. For those who are inexperienced with platform games, this is a good one to try, with plenty going on to hold the interest. For those who are platform fans, this is one of the best in a while. Definitely recommended.

Keith Martin



● *I don't think I'm doing too well here*

PRODUCT SPOTLIGHT

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Mayhem

... the grand design

MOST computer games tend to go for action and flashy effects, the software equivalent of watching a movie. Others, however, try for something more along the lines of a traditional board game: Simple basics of play with a degree of skill and strategy.

Mayhem is a new entry in the field with a certain style of its own. Once again, pieces fall from on high to the bottom of the screen and you need to put them into patterns. In Mayhem the patterns – called *formulas* – vary from level to level.

In each case you have to create a specific number of rows, columns or diagonals out of a given type of piece. All this gets harder (what else?) in the later screens.

As you make progress the type of pieces you have to deal with become more unusual and striking. You start off with circles of different colours, then squares and triangles. Later on you get sprites in the form of diskettes, chess pieces, flags of the European nations and, my personal favourite, Met Office weather symbols, the latter falling across a map of the UK.

There are special features, triggered by symbols on the screen through which the pieces can fall. These include bonus scores (or negative scores), extra time and jumps to the next level. There are also question mark symbols which trigger a range of features that can make life difficult or annoying (like turning the already fallen pieces invisible).

This is a fun game in the Tetris style with a lot of variety provided by the different formulas that are needed and by the ingenious screen images themselves. Even better is the fact that when you've finished all the levels you can design your own.

Keith Martin

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● *A stylish game, which can be very frustrating – thank goodness for the jump bonus*

● *I wish the weather was really so easy to control*

Twin peep

Mike Cook concludes hi

LAST month I looked at the reasoning behind stereoscopic images and 3-D displays. Now let's get into the actual programs.

When you first run the program the bank swapping routine can be in any phase, that is a limitation on the computer's hardware. Therefore you need to alter the phase switch on the synchronisation electronics – make sure you can see the words *Left Eye* only through your left eye.

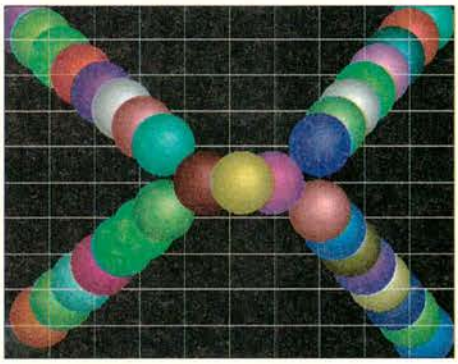
Then run the first demo. This simply puts a full screen of red for the right eye and green for the left. Stand back from the blades and you should see alternate triangles of red and green in place of the blades. Adjust the phase fine adjustment on each motor until they are centred on the line joining the centres of the two motors.

The simplest way to produce a stereoscopic 3-D image is to switch to one bank, draw the picture, then switch to the other bank and draw it again. This works best when you are showing screen dumps.

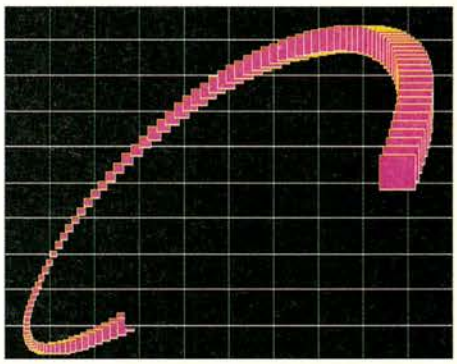
Most of the time you want to use the familiar move and draw, therefore there is a procedure that takes X and Y data as well as displacement or depth and draws the line in the appropriate place in each bank. This could have been implemented as a module but I preferred to leave it as a Basic procedure.

There is no room on the disk to have any screen dump examples but they are available from Musbury Consultants. These can be produced from either a video digitiser or a ray tracing package like Render Bender.

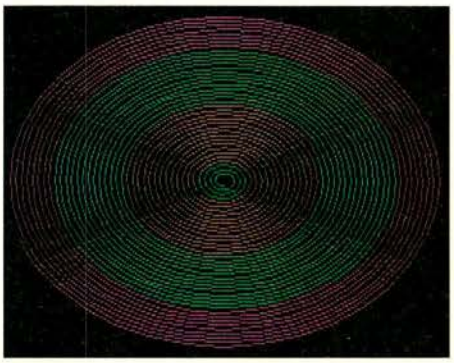
Using a digitiser can be a little more tricky than it sounds. Basically you have to take two pictures of the



● *A pyramid of balls – if the phase switch is wrong you will not see the effect*



● *The 3-D snake again – get the phase switch right*



● *Swap the phase switch during the tunnel demonstration. As there are no other depth cues the tunnel will flip into a pyramid*

Depth perception: How do our brains really cope?

Designing the Twin Peeps machine made me think about just how our poor befuddled brains manage to perceive depth at all.

The conventional wisdom concerning our perception of stereoscopic 3-D vision is that our brain gets feedback from the muscles controlling the eye. By sensing how much each eye has to independently move to focus on an object we get an impression of depth.

Well that's what it said in the book but it seems to me it's not the whole story. For a start when looking at a computer stereoscopic display it is perfectly possible to perceive the depth of an object without actually focusing on it.

You can keep your eyes on one object and quite easily tell the depth of another seen through peripheral vision. Secondly, when showing the stereoscopic viewer to a wide range of people occasional interesting reactions have cropped up.

I have a friend who has considerable loss of vision in one eye. This is nothing to do with the eye but to a brain disorder. He expected to see no effect with my viewer. However, to his surprise he did see a strong 3-D effect as long as he did not focus on anything. When he did focus on an object the whole field went flat.

Another friend who has a wandering eye claimed that he could make objects appear to stand out of the screen or recede behind the screen at will.

Finally there is the subject of random dot stereograms. Here there are not two objects to focus on but only a repeated dot pattern. In fact, the effect here can only be seen when you consciously unfocus your eyes.

It seems that, while differential eye movement might play a part in depth perception, it is by no means the whole story. The perception of depth lies in the image processing done by the brain. It can pick up the difference in position of an object in the two eye images and then work out the depth by the amount of shift or lateral displacement shown in the two fields of vision.

Focusing on an object then helps as the amount of shift is maximised for objects both in front of and behind the object being focused on.

Those people with eye defects learn to cope in the world by adopting different strategies for perceiving depth. When it comes down to it, the human brain is far and away the most superior image processing system ever built.

s two — the program

feature on a 3-D display system

same scene shifting the camera about 8mm to the right for the second exposure. However, you have to be careful not to introduce any rotation in the camera's pointing direction or you will not see any 3-D effect.

I did this by picking an object that I wanted to appear in the plane of the screen and marking it on the computer's display with a reinforcing ring – the type used in loose leaf ring binders. When I took the second picture I made sure that the camera was panned so that the same object appeared in the same place.

Creating effects

I did not have as much success with Render Bender as I expected. There are two points to watch here. First of all the viewpoint must be specified as an angle from the observer and not a coordinate in the scene, otherwise the geometry is all wrong and you get no 3-D effect.

Secondly you have to watch how the background behaves – this can also ruin the effect. The most successful technique I found was to draw two frames where the objects were moved to the left by a varying amounts depending on their distance from the view point.

As I said at the start, the production of two different views is only part of the brain seeing a stereoscopic 3-D picture. The picture also has to be consistent with what you expect.

For example, suppose there are two objects that overlap – you expect the one that obscures part of the other to be closer to your eye. If the two images fed to each eye contradict this expectation the brain becomes confused and is likely to see this as a flat picture.

You can see an example of this by swapping the phase switch while viewing an image.

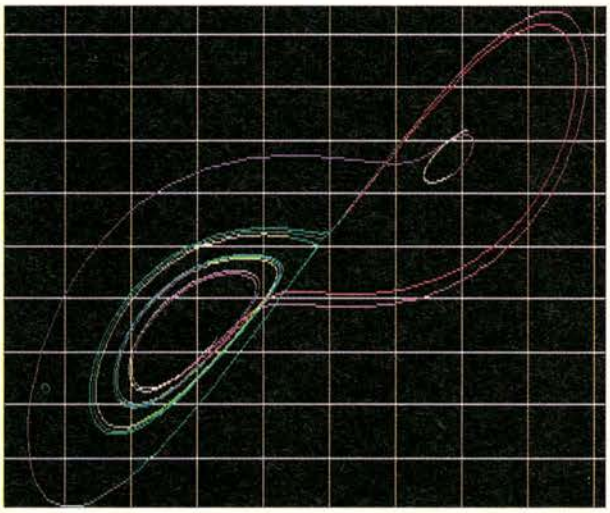
Take the tunnel demonstration: There are no other depth cues here and altering the phase switch will flip the tunnel into a pyramid.

However, if you try this with the multi-coloured balls you will not see the depth flip. This is because there are other depth cues in the picture like the grid in the plane of the screen and the overlapping of the balls.

All the demonstrations use the broadcast TV modes, that is the non-multi-sync modes. The sync separator will extract the frame sync from any mode screen but there are some snags. Mode 20 will work fine but Mode 21 will not.

This is because Risc OS 2 will not allow you to allocate more than 480k screen memory and there isn't enough there for two banks. The same thing applies to VGA modes like 28 and there is a further snag. Here the frame sync rate is about 16mS and not the normal 20mS. This means that the motors will have to run faster in order to lock. I managed this with my system by upping the motor voltage to 15 volts.

Well after all that what does it look like? I must say I was very impressed, and the 3-D effect was quite stunning. My favourite picture is the view of the Lorentz attractor, with the curve being drawn in space in front of the screen. You can see exactly how one loop fits inside another and never crosses itself.



● *The Lorenz Attractor – watch the curve being drawn in space in front of the screen*

Onlookers see a flickering tangled mess of lines but you can see the beautiful twin butterfly wings. It's one of those projects you simply must see to appreciate. In fact in terms of impressiveness I reckon it's my best to date.

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Remember

The !3DSetUp program should be copied from the compressed disk as it will not run under ArcFS. The reason for this is that when colour values are set up they are written back to the !Boot file. This will mess up the disk if running within the archive.

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Please specify Archimedes type, not compatible with A3010, A3020, A4000. **£185**

- Scan256 for A3000 Micro £199

A3010 DTP Pack

Supplied with 3.5" Floppy Disc Drive and a mouse, Colour Monitor and lead, TV modulator, 20Mb fast IDE Hard Disk Drive, 'Compression' utility to increase the Hard Drive capacity to typically 40Mb, the highly acclaimed Computer Concept's Impression Junior DTP package, EasiWord wordprocessor, Quest for Gold game, applications suite of software packages and comprehensive audio training tape.

RRP: £1095

Sale Offer Price: £739

- A3010 DTP Pack with Learning Curve £839
- Additional 1Mb RAM fitted £39

Special Education discounts available on micros, RAM upgrades, ARM 3 Turbo Card, etc. Please write in or telephone:

0582 48 77 77

A3000 Accessories

• 3.5" External Drive	£95	• Monitor Stand	£15
• Technical Manual	£39	• Serial Upgrade	£19
• A3000 Dust Cover	£5	• Micro+monitor cover	£9
• Acorn Carrying Case for A3000			£10
• A3000 User Port/Midi Upgrade Card			£44
• A3000 User/Analogue/IIC I/O Card			£38
• A3000 External Podule Case			£15

Archimedes RAM Upgrade

All our memory upgrades are simple to fit. No soldering required. Fitting instructions supplied.

• **R300**-4 Layer RAM upgrade board (Bare).	£25
• **R302**-A3000 – to 2MB RAM Upgrade	£29
• **R303**-A3000 – to 2MB RAM Upgrade (expandable to 4MB)	£49
• **R304**-A3000 – to 4MB RAM Upgrade	£99
• **R305**-A3010 – to 2MB RAM Upgrade	£39
• **R306**-A3020 – to 4MB RAM Upgrade	£70
• **R311**-A305 – to 1MB RAM Upgrade	£30
• **R312**-A305/310 – to 2MB RAM Upgrade	£85
• **R314**-A305/310 – to 4MB RAM Upgrade	£229
• **R412**-A410/1 – to 2MB RAM Upgrade	£25
• **R413**-A420/1 – to 4MB RAM Upgrade	£50
• **R414**-A410/1 – to 4MB RAM Upgrade	£75
• **R810**-A410/1 – to 8MB RAM Upgrade	£399
• **R820**-A420/1 – to 8MB RAM Upgrade	£375
• **R840**-A440/1 – to 8MB RAM Upgrade	£315
• **A5000** – to 2MB additional RAM Upgrade	£82

Desk Top Publishers

Acorn's Archi DTP Package	£69
• **Equasor** £39; • **Expression-PS**	£19
Impression 2 DTP Pack	£123
Impression Junior	£65
Impression Business Supplement	£39
Impression II Borders Disc	£19
Ovation DTP	£85
Desk Top Thesaurus	£18

Archi Wordprocessors

Pendown Archi	£48	Easiwriter	£115
Pendown Plus	£68	EasiWord	£58
Pipedream Spell Checker	£40	Prime Word	£52
Graphic Writer	£20	Wordz	£85

DATABASES

Flexifile	£79	Multistore v2.01	£174
Knowledge Organiser	£42	Pinpoint	£65
Magpie	£40	Pinpoint Junior	£23

SPREADSHEETS

Eureka	£99	Schema	£89

BUSINESS GRAPHICS

GammaPlot	£39	Sigmaplot	£39

INTEGRATED PACKAGES

- Pipedream 3 £116 • Pipedream 4 £146
- Desktop Office – Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio – Wordprocessor, Desktop & Interactive Publishing. Ideal for school £59
- Acorn Advance package £99

Acorn Multimedia

Multimedia Expansion £499
Multimedia Expansion + 16 bit SCSI

Hi-Speed, Low Cost Archi Hard Disc Drive

Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.
Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine.
A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tempering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.
By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon
- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	**£189**
ADA 0530	100Mb	16mS	**£259**
ADA 0570	200Mb	15mS	**£369**
ADA 0580	330Mb	15mS	**£599**

All above 3.5" Drives are supplied complete with Controller Card & cable for use with A300/A400/A500 series machines.

AAA 0300 External Case & PSU for A3000 **£85**
AEA 1060 Archi IDE Hard Disc Podule only **£89**

A5000 Internal IDE Drive

ADA 0940	100Mb	16mS	**£195**
ADA 0950	200Mb	15mS	**£275**
ADA 0580	330Mb	15mS	**£525**
ADA 1030	80Mb	17mS	**£189**

A5000 2nd Internal IDE Hard Drive

ADA 0960	100Mb	16mS	**£205**
ADA 0970	200Mb	15mS	**£285**
ADA 1010	330Mb	15mS	**£535**
ADA 1040	80Mb	17mS	**£195**

Internal Hard Disc Drives for A3000/A3010

State of the art, 4 layer internal IDE Hard Cards for the A3000. Software supplied in, On-board ROM.

ADA 0150	20Mb	19mS	**£149**
ADA 0770	30Mb	19mS	**£185**
ADA 0750	60MB	18MS	**£259**
ADA 0720	80Mb	18mS	**£299**
ADA 0730	120Mb	16mS	**£395**

Supplied ready assembled. No soldering required. Simply plug into the allotted space.

Archi IDE Hard Cards

"Simply plug and play"

Watford's easy to instal, low cost, high performance, revolutionary IDE Hard Cards for the A300 & A400 series Archimedes.

ADA 0650	20Mb	19mS	**£159**
ADA 0800	30Mb	19mS	**£195**
ADA 0660	40Mb	28mS	**£289**
ADA 0890	60Mb	18mS	**£299**
ADA 0670	80Mb	18mS	**£309**
ADA 0600	120Mb		**£405**

(All above Hard Cards can be used as Removable Hard Drives. Ideal for Military and Education use.)

Archi to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.
New RISC OS Version also available (please specify)

- For A3000 **£15** • For A5000 **£16**

For A3000 Serial Upgrade **(£19)** required

Cortian CKAI Interface

Eliminates need to have a User port in A3000/305/310/400/540 when using Concept Keyboard. **£29**

Concept Keyboards

- A4 Standard Pack **£95**
- A4 Primary Pack **£100**
- A4 Designer Pack **£110**
- A3 Standard Pack **£99**
- A3 Primary Pack **£105**
- A3 Designer Pack **£110**
- Universal 2010 Keyboard A3 **£115**
- Universal 2010 Keyboard A4 **£110**

A3000 I/O Card (User, Analogue & IIC)

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analog to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

Features

- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analog to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices. **£38**

VISA Access AMERICAN EXPRESS

CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 250234 or 233383

Leasing finance at very attractive rates now available to Businesses (subject to status), Schools, Colleges, Universities, Government Depts. and Local Councils. Minimum order £1,000. Please telephone for details.

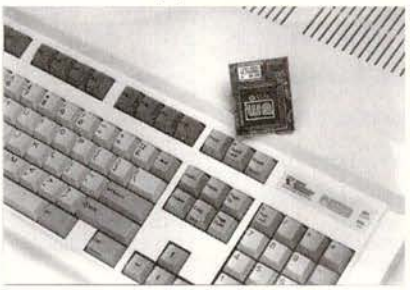
Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Upto 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.
Price £21

Back Plate Extension
• A300/400 **£15;** • A3000 **£14**

ARM 3 Turbo Card MkII

Simply The Best



Here it is at last – the all new Mark 2 version of Watford's highly acclaimed ARM 3 processor board for the Archimedes and now also the A3000 series computers. Using the latest surface mount technology on a high quality four layer circuit board we have reduced the overall size to a mere 53mm x 45mm, and the cost to only £145. Mk II upgrade will increase the speed of your micro by a factor of 3 to 6.
Any competent A300 or A400/1 series micro owner can fit the upgrade himself, as we provide full fitting instructions and a special ARM chip extraction tool. However for A3000 micros and those not wishing to perform the upgrade themselves, we will collect, upgrade and return your micro by courier service, at an additional cost of £24.
(A300 and old A440 series owners please note – you will need to upgrade to MEMC1A for ARM3 to work.)

RRP £249

Special Offer £145

Acorn have satisfactorily evaluated Watford's ARM 3 upgrade and the A3000 upgrades are fitted by Acorn approved surface mount technology centre, therefore its fitment will not invalidate Acorn's warranty on the micro.

BBC/Master Accessories

Econet Module for the Master		£42
Twin ROM Cartridge for Master		£9
Quad ROM Cartridge for Master		£14
Master Reference Manual I	(No VAT)	£14
Master Reference Manual II	(No VAT)	£14
Master Advance Ref Manual	(No VAT)	£14
64K Upgrade Kit for B+		£32
ECONET Upgrade Kit for BBC B		£42
ALL ECONET UPGRADES Available		
ARIES' IEEE Interface for BBC B & Master		£238

Low Cost Finance now available, subject to status. For further details, please contact our sales team.

Continued→ → → → → → → → →

BBC Education Software

A vous la France	French programs for beginners	£29
Au restaurant/Accident de route	French games for 12 years +	£26
Bolougne and oh les	French program for beginners	£26
Computer control	Program simulating computer control	£26
Computers at work	Primary education program	£17
Espana Viva	Spanish educational programs	£20
Folks Tales	Listening and reading for ages 7+	£22
Geordie Racer	Look and read for ages 7+	£22
Hall of Mirrors	Practice word & number skills	£22
Help your child learn basic mapwork 2		£18
Inside Science	Four common science subjects	£22
Letters and pictures	Educational programs for 6-8 years	£15
Make a wildlife garden	Explore wildlife/weather/garden growth	£22
Maths with a story 1	Primary level maths programs	£20
Maths with a story 2	4 further maths programs	£20
Note invaders	Learn sheet music for 7-Adults	£15
Numbers & Pictures	Early number learning (4-6 years)	£15
Picture craft	Geometrical design & Colouring	£17
Puncman 1 & 2	Learning Punctuation (7-13 years)	£15
Puncman 3 & 4	Learning Punctuation (8-14 years)	£15
Puncman 5, 6 & 7	Learning Punctuation (8-15 years)	£15
Ramayana Tales	Simple Desktop Publisher using pictures & characters from the Ramayana	£22
Skyhunter	Look and read educational adventure	£22
Technology and design	Problem solving programs	£22
Through the dragons eye	Adventure game and Map reading	£22
Fun School 3 (Under 5)	Varied range of Education subjects	£17
Fun School 3 (5-7)	Varied range of Education subjects	£17
Fun School 3 (Over 7)	Varied range of Education subjects	£17

Archi Educational Software

- 10 out of 10 Early essentials £20
- 10 out of 10 English £20
- 10 out of 10 Maths £20
- Animated Alphabet (3-6 yrs) £21
- Arcventure (8-12 yrs) £29
- Bookbinder £43
- Bumper Disc £14
- Bumper Disc 2 £14
- Craftshop 1 £19
- Craftshop 2 £19
- Converta-Key £16
- Data Word £16
- Desktop Stories £35
- DigiSim £35
- Dream Time (5-7 yrs) £23
- Farm (5-7 yrs) £19
- Fleet Street Phantom (9-13 yrs) £25
- Fun School 3 Red (up to 6 years) £17
- Fun School 3 Green (6-8 years) £17
- Fun School 3 Blue (8 years +) £17
- Gate Array Teaching System £68
- Glimpse Clip Art Utility (7-16 yrs) £8
- Highlighter (6-16 yrs) £42
- Jigsaw £19
- Mapventure (9-13 yrs) £24
- Microbugs £24
- Money Matters £16
- Nature Park Adventure (7-9 yrs) £27
- Numerator £60
- Picture Book £16
- Recall (6-13 yrs) £39
- Sellardore Tales £24
- Snippet £36
- Space Mission Mada (9-13 yrs) –
- Sting of the Dump (9-13 yrs) £22
- Viewpoints (9-12 yrs) £33
- Wizard's Revenge (7-10 yrs) £17
- Worst Witch (7-10 yrs) £25

Archimedes Software

GRAPHICS

3D Construction Kit	£39
Arc Light	£46
ARCtist	£19
ARCticulate	£19
Art Works	£129
Atelier	£60
Artisan II	£45
Artisan Gallery	£16
Autosketch II	£65
CADet (CAD)	£140
Clip Art Set 1	£28
Clip Art Set 2	£28
Concept Designer	£23
Craftshop 1 & 2	£28
Euclid 2	£50
Graph Box	£59
Graphbox Professional	£107
HotLink Presenter	£40
Illusionist	£69
Kermit	£46
Mogul	£17
PCAD Educ.	£395
Poster	£75
Pro Artisan	£70
ProCAD	£475
Prime Art	£46
Render Bender 2	£79
Revelation 2	£80
Titler	£119
Tween	£29

GAMES

Air Supremacy	£17
Apocalypse	£14
Arcade 3 Compilation	£12
Battletank	£10
Black Angel	£27
Boogie Buggy	£14
Break 147 + Supa Pool	£19
Bughunter in Space	£12
Cataclysm	£19
Caverns	£10
Champions	£25
Chess 3D	£16
Chocks Away	£27
Compendium	£32
Chocks Away Extra	£14
Chuck Rock	£18
Conqueror	£15
Cyber Chess	£38
Cycloids	£20
Ego Repton 4	£–
Elite	£33
Enter the Realm	£19
E-Type Compendium	£20
E-Type Designer	£13
Fervour	£35
Galactic Dan	£19
Gods	£24
Grievous Bodily Arm	£19
Hero Quest	£25
Holed Out Designer	£13
Holed Out Golf Comp	£20
Inter Dictor 2	£26
Iron Lord	£15
Jahangir Khan Squash	£19
Lemmings	£20
Oh no more Lemmings	£15
Lost Temple	POA
Lotus Turbo Challenge	£19
Mad Prof Mariarti	£17
Masterbreak	£16
Man at Arms	£14
MahJong Patience	£15
Manchester United II	£19
Nebullus	£21
Nevryon II	£20
Omar Sharif's Bridge	£23
Pandoras Box	£18
Pipe Mania	£17
Play It Again Sam	£–
Populous	£23
Pysanki	£14
Quazer	£10
Real McCoy 2	£23
Real McCoy 3	£22
Redshift	£14
Return to Doom	£16
Repton 3	£14
Saloon Cars Deluxe	£27
Sim City	£22
Spitfire Fury	£22
Superior Golf	£14
Superpool + Break 147	£22
Swiv	£19
Talisman	£12
Techodream	£20
Trivial Pursuit	£22
Twin World	£15
U.I.M.	£23
White Magic 2	£15
Worldscape	£16
XFire	£19
Zelanites	£23

Miscellaneous

Ancestry	£59
Arccomm 2	£38
Arcterm 7	£64
Armadeus Sound	£60
Avante Garde Fonts	£23
Battle Chess	£25
BBC DFS Reader	£6
Broadcaster Loader	£65
Chameleon	£34
Chart Well	£25
Chatter	£34
Compression (CC)	£38
Craftshop 1	£27
Craftshop 2	£27
Desk Edit 2	£29
Equasor	£38
FlexiFile	£97
Genesis	£10
Genesis Plus	£68
Genesis 2	£99
Investigator 2	£22
Magpie 2	£42
Notate	£42
Numerator	£66
Pin Point	£65
Polyglot	£16
Presenter 2	£29
Presenter Story	£145
Prophet Accounts	£132
Prophet Demo Disc	£10
Rainforest	£17
Revelation 2	£95
Rhapsody in Blue 2	£45
Score Draw	£46
Show Page	£127
Speech!	£15
The Victorian	£17
Time Tabler	£549
Toolkit (Clares)	£35
Touchtype	£40
Tracker	£39
Turbo Driver BJ10E	£42
Type Studio	£43
Vox Box	£46
Wimp Programmer's Toolkit	£16
WorldScape	£17

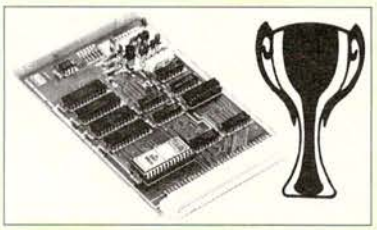
LANGUAGES

Desktop C	£199
Macro Assembler	£40
Robo Logo	£69
BASIC Compiler	£77
Logotron Logo	£45
Risc BASIC	£120
Risc FORTH	£110
Cambridge Pascal	£95

BBC/Master Games

Acornsoft Hits 1	£10	Sim City	£10
Acornsoft Hits 2	£10	Superior Collection 1	£10
Air Supremacy	£10	Superior Collection 2	£10
Play It Again Sam 1	£10	Play It Again Sam 9	£10
Play It Again Sam 2	£10	Play It Again Sam 10	£10
Play It Again Sam 3	£10	Play It Again Sam 11	£10
Play It Again Sam 4	£10	Play It Again Sam 12	£10
Play It Again Sam 5	£10	Play It Again Sam 13	£10
Play It Again Sam 6	£10	Play It Again Sam 14	£10
Play It Again Sam 7	£10	Play It Again Sam 15	£10
Play It Again Sam 8	£10	Play It Again Sam 16	£10

Archi Real-Time Digitiser



Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air televison signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £75

A Set of Colour Filters for colour image grabbing using a video camera **£16**

Archi Graphic Tablet

Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra **£20**

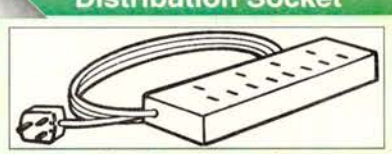
Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus **£105**

Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage translent spikes/surges caused by lightning or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets.
Supplied wired up with mains plug ready for use.
Can be screwed to floor or wall if required.
Very useful for tidying up all the mains leads from your peripherals.

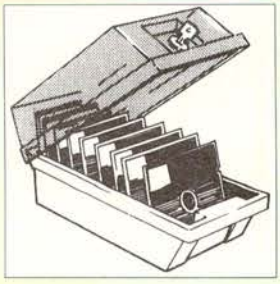
£9.50

Aries Spike Cleaner Unit

A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

£16

Antistatic Lockable Disc Storage Units



- **M35** – holds up to 50 5.25" discs **£4.95**
- **M85** – holds up to 95 5.25" discs **£6.95**
- **M25*** – holds up to 25 3.5" discs **£4.95**
- **M50** – holds 50 3.5" discs **£6.50**
- **M100** – holds 100 3.5" discs **£6.99**
- **M10** – holds 8 of No. 10 Data Cartridges **£15**

* Not lockable

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

£2

3M – Diskettes

Lifetime warranty on 3M Discs

- *10 x 5.25" S/S D/D 40T (744)* **£5**
- *10 x 5.25" D/S D/D 40T (745)* **£5**
- *10 x 5.25" S/S D/D 80 Track (746)* **£6**
- *10 x 5.25" D/S D/D 80 Track (747)* **£7**
- *10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT* **£8**
- *10 x 3.5" S/S D/D 40/80 Track* **£6**
- *10 x 3.5" D/S D/D 40/80 Track* **£6**
- *10 x 3.5" Double Sided High Density* **£10**

Top Quality Diskettes

Watford's life time guaranteed disc are supplied complete with self stick labels & plastic library case.

- *10 x **M3** 3.5" D/S D/D 80 Track* **£6**
- *10 x **M9** 3.5" D/S High Density* **£10**
- *10 x **M4** 5.25" S/S D/D 40 Track* **£5**
- *10 x **M5** 5.25" D/S D/D 40 Track* **£5**
- *10 x **M7** 5.25" D/S D/D 80 Track* **£6**
- *10 x **M8** 5.25" D/S H/D Hi-Density* **£9**

Special Bulk Offer Discs

(Lifetime warranty on Discs)

BULK PACK DISCS in lots of 100

Type	S/S 40T	D/S 40T	D/S 80T
• Without Sleeves 5.25"	£25	£30	£35
• With Sleeves 5.25"	£28	£33	£38
• 3.5" D/S D/D	£21 for 50		£39 for 100
• 3.5" D/S H/D	£40 for 50		£75 for 100

Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

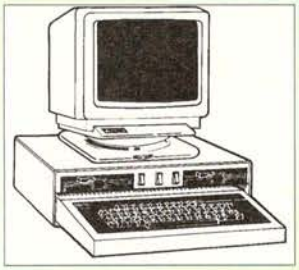
3.5" Disc Drive

These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
	Disc Drive without PSU	
• **CLS35:**	Single Disc Drive, 400K	**£59**
• **CLD35:**	Twin Disc Drives, 800K	**£109**
	Disc Drive with PSU	
• **CS35:**	Single Disc Drive, 400K	**£82**
• **CD35:**	Twin Disc Drives, 800K	**£126**

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drives in Monitor Stand



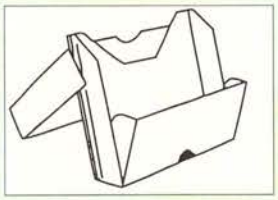
• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£150

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

£145

Plastic Library Cases



DLC1 – Holds 5 x 3.5" Discs. **£1.50**
DLC2 – Holds 10 x 3.5" Discs. **£1.90**
DLC3 – Holds 5 x 5.25" Discs. **£1.60**
DLC4 – Holds 10 x 5.25" Discs. **£2.00**

Disc Albums

Attractively finished in leather-look PVC Vinyl

DW1 – Holds 6 x 3.5" Discs **£2.50**
DW2 – Holds 6 x 5.25" Discs **£3.00**
DW3 – Holds 20 x 5.25" Discs **£3.50**
DW4 – Holds 40 x 3.5" Discs or 5.25" Discs **£4.50**

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. it is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Acorn & Watford DFSs

- Watford sophisticated DFS ROM **£16.00**
- Watford DFS Kit complete **£49.00**
- DFS Manual (comprehensive) **£6.95**
- Acorn DNFS ROM **£17.00**
- Acorn ADFS ROM only **£25.00**
- Acorn 1772 DFS ROM Kit **£49.00**
- Acorn DFS Kit complete **£48**

Watford's MkII 1772

Single/Double Density DFS

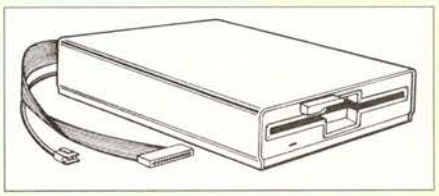
Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1772 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1772 DFS, plus many more added features.

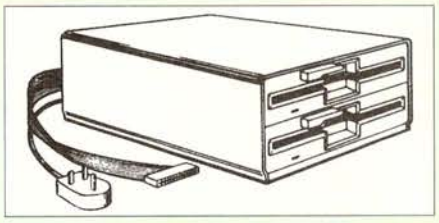
- Complete Kit Special Price **£44**
- DDFS Manual (No VAT) **£6.95**

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).
P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"





Our Disc Drives conform to BS415

Type	Description	
	Disc Drive without PSU	
• **CLS400S:**	Single, 40/80 track 400K Double sided Drive	**£70**
• **CLD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£138**
	Disc Drive with PSU	
• **CS400S:**	Single, 40/80 track, 400K Double sided Drive	**£80**
• **CD800S:**	Twin, 40/80 track, 800K Double sided Drives	**£149**

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Continued→ → → → → → → → →

Microvitec Monitors

- **1431** – Standard Resolution Monitor #£175
- **1451** – Medium Resolution Monitor #£215
- **Cub3000** Medium Res for A3000 #£195
- Dust Cover for Microvitecs £5.50
- **Touchtec 501 Touch Screen** £239
- **Touchtec 3000** £–

Includes 3 years parts & labour warranty

Multiscan Colour

- Eizo F550i £749
- Eizo T560iT £1345
- Eizo T660i-T 20" £1655
- Eizo 9060 £398
- NEC 2AN £269
- NEC 3FG £350
- NEC 4FG £517
- NEC 5FG £975
- NEC 6FG £1739
- Taxan 787 £238
- Taxan 787LR £265
- Taxan 795PC £465
- Taxan 875+ £729
- Taxan 875+ LR £799
- Taxan 970 £1225
- VIDC Enhancer £25

Aries AlphaScan Monitor

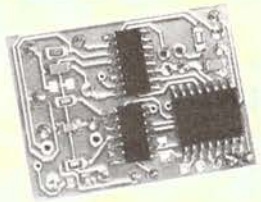
Its multiscan circuitry provides automatic adjustment for frequencies between 31 and 56KHz horizontal, and 43 and 70Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The VIDC Adaptor supplied with the monitor allows high resolution operation in all screen modes. **£325**

- Aries Alphascan 17" Plus £585

Philips Monitors

- **BM7502** 12" Hi-res Green Monitor £88
- **CM8833** 14" Med. Res Colour Monitor £195
- Dust Cover for Philips Monitors £6
- Spare Monitor Leads (various) £7

VIDC Enhancer



This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A Desk Top application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: Its unique design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control **£45**

MultiVideo VIDC Card: As above but for MultiScan monitors only. **£25**

Integrex Ink Jet Printers

- Colour Jet 132 Printer £425
- Paper Roll £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £21
- Black Cartridge £12.40
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123
- Colour Jet 2000 £599
- Betajet Ink Jet Printer £185
- Betajet Cut Sheet Feeder £43
- Integrex Colourjet Series 2 £335
- Auto Sheet Feeder for Series 2 £45

Printer Leads

- BBC Centronics 4' £5; 6' £6
- Archi Parallel 2m £5; 5m £9; 10m £13
- PC Parallel 2m £5; 5m £9; 10m £13
- 25 pin D Male/Male 2m £5; 5m £10
- Centronics Double Ended 4' £5
- Centronics Double Ended 6' £6
- RS232 Leads Various £POA

Star Printers

	Printer	CSF	Ribbon
LC15	£190	£119	£4
LC20	£104	£69	£4
LC100C	£126	£69	£12
LC24-15	£245	£119	£5
LC24-100	£143	£69	£5
LC24-20 Mk2	£169	£69	£5
LC24-200C	£214	£69	£12
LC200 C	£151	£69	£12
SJ-144	£POA	–	–
STAR JET	£169	£43	£16
XB24-200C	#£324	£80	£12
XB24-250C	#£389	£139	£12
ZA-200C	#£260	£–	£12
ZA-250C	#£324	£–	£12

Includes 12 months on-site warranty

- Star/Archimedes Colour Printer Driver £15
- Black Ribbons for Colour Printers £5
- Serial 8K Serial Interface LC10/15/24/200 £52
- 32K Buffer LC/XB24-10; 15; 200 £52

NEC Pinwriter Printers

	Printer	CSF	Ribbon
P220	£189	£59	£6
P30	£235	£59	£6
P62	£342	£89	£8
P72	£406	£115	£8
P90	£579	£115	£8

- Black Ribbons for P20; P30 £6
- Ribbons for P60/70/P90 Black £8; Colour £14
- P60/70 Colour Option Kit £59
- CSF for P20 £59; P60 £89; P70 £89

Panasonic Printers

	Printer	CSF	Ribbon
KX-P1123	£126	£59	£6
KX-P1170	£98	£59	£6
KX-P1624	£264	£126	£8
KX-P1654	£330#	£126	£8
KX-P1695	£267	£126	£8
KX-P2123M	£144	£79	£8
KX-P2123C	£194	£79	£15
KX-P2124	£215	£89	£8
KX-P2180M	£126	£79	£8
KX-P2180C	£143	£79	£15
KX-P2624	£269#	£126	£8

Includes 12 months on-site warranty

- Dustcover for 80 column printers £6
- Serial Interface for above Printers £46
- Black Ribbons for P1081, 1180, 1124 £6
- Brown, Blue or Red Ribbons for KX-P1081/1592/1595/1695 £9 each
- 32K Buffer for above Printers £16

P.S. We only sell original Panasonic Ribbons which are guaranteed to last 3 million characters

Citizen Printers

- 120D+ £98
- Swift 9 £145
- Swift 9X £185
- PN-48 £189
- ProJet £299
- Swift 200 £178
- Swift 240 £200
- Swift 240C £212
- Swift 24X £299
- AH29804 Manual Cut Sheet Feeder for Swift 9/24/124. Holds 50 Sheets £29
- Cut Sheet Feeder for 80 col. printers £75

+ FREE 2 years Parts and Labour warranty on all Citizen Printers

- Swift 9 Colour Option £19
- Swift 24 Colour Option £29
- Swift 24 Ribbons Black £4 Colour £13
- Swift 24X Ribbons Black £8 Colour £16
- Citizen/Archimedes Colour Printer Driver £15
- Citizen 120D Ribbons £3.50

Laser Printers

All Laser Printers (excluding HP Laserjets) include 12 months On-site maintenance

Brother HL4-VE	4ppm	£594
Brother HL4-PS Postscript	4ppm	£974
Brother HL-10V	10ppm	£1045
Brother HL10PS	10ppm	£1329
Brother HL10DV	10ppm	£1149
Brother HL10DPS	10ppm	£1445
Canon LBP4 LITE	4ppm	£492
Canon LBP4+ 1.5M RAM	4ppm	£644
Canon LBP-8III Plus	8ppm	£945
Canon LBP-8 plus IIIR	8ppm	£1435
Canon LBP-8 IV 600 DPI	8ppm	£989
Epson EPL4300	6ppm	£475
Epson EPL5200 – NEW –	6ppm	£565
Epson EPL7500	6ppm	£1139
Epson EPL8100	10ppm	£920
Fujitsu VM600	5ppm	£579
Fujitsu VM800 (Best Buy)	8ppm	£535
HP Laserjet IIIP	4ppm	£639
HP Laserjet IIISi PS	16ppm	£POA
HP Laserjet 4L – NEW	4ppm	£515
HP Laserjet IV (600 dpi)	8ppm	£1075
HP Laserjet 4M PS	8ppm	£1425
HP Laserjet 4Si MX 1200 DPI	16ppm	£2329
NEC Silentwriter S62P P/script	6ppm	£994
NEC Silentwriter 266	8ppm	£669
NEC Silentwriter 290P P/script	8ppm	£1469
NEC Silentwriter S102	8ppm	£995
OKI OL400E	4ppm	£449
Panasonic KX-P4410	5ppm*	£462
Panasonic KX-P4430 Satin Print*	5ppm*	£594
Panasonic KX-P4451	11ppm*	£919
Panasonic KX-P4455 Postscript	11ppm*	£1249
Star LP-4 Postscript	–	£774
Star LP-8 III 2	8ppm	£1249
Star LP-8 III	8ppm	£899
Star LP-8 Star (post)script	8ppm	£1130
Star LS-5	5ppm	£489
Star LS-5 EX (RISC Based)	5ppm	£599
Star LS-5 TT True Type + Mac	5ppm	£775

* Now with 2 years On-site warranty

HP Laserjet IIIP 3 years on-site	£150
HP Laserjet IIISi 3 years on-site	£450
HP Laserjet 4/4M 3 years on-site	£170

Laser Toners

Canon 2, 3 & 4	£52
Epson GQ	£13
EPL4/41/4300	£55
EPL7100/7500/8100	£117
KX-P4420/50/55	£20
KX-P4410/30	£29
Qume Crystal (3)	£75
HP IIP & IIIP	£54
HP II/D, III/D	£60
HP 4 & 4M	£72
OKI OL400/800	£48
VM800 8K pages	£99
NEC SWriter	£84
Star LP4	£52
Star LP8/Canon 8	£59
Star LS 5	£69

Laser RAM Upgrades

Type	1M	2M	4M
IIP; III/P	£49	£80	£132
II & IID	£60	£96	£142
LJ4/4M	£– 8M/£279	£75	£175
EPL4100	£– 512K/£52	£120	–
Canon LB8	£139	£275	–
KX4420/50i	£59	£89	£149
NEC S62/S102	£99	£180	–
Star LPB	£139	£275	–

Laser Drum & Developer

- Epson Drum GQ5000 £93; EPL7100 £129
- Panasonic 4420 Drum £60; Developer £80
- Panasonic 4450 Drum £93

Jetpage Postscript Cartridge

- HP IIP/III £225
- HP IID & IIID £227

Various Add-Ons

- HP Adobe costscript + Cartridge £359
- HP Premier Font Collection £28
- Laserjet various Font cartridges from £45
- Canon LBP-4 Lower Cassette Tray £96
- HPIIP/IIIP Lower Cassette Tray £96
- HP Postscript Module for LJ4 £270
- Laserjet 4 Powered envelope feeder £199
- Ethernet Card for Laserjet 4 £359
- LP4 500 Sheet paper cassette 3rd Bin £205

Fujitsu Printers

- B-100 InkJet – HP Deskjet compatible 300dpi, whisper-quiet & 6 resident fonts #£159
- B-200 InkJet – HP Desk Jet compatible 300dpi. Built in Cut Sheet Feeder. Optional 2nd Bin/Tractor available #£239
- DL-1150 Dot Matrix – 24 pin, 110 column Colour optional £209
- DL-1150colour Dot Matrix – 24 pin, 110 column With colour option £235
- DL1250 £344
- DL4600 £799
- DL5800 £999
- DL3600 £439
- DL1250colour £344
- Joywriter £249
- B-100 Cut Sheet Feeder £65
- B-200 2nd Bin Sheet Feeder £95
- B-200 Tractor Unit £65
- B-100/200 Ink Cartridges £14
- DL-1100 Colour Upgrade £39
- DL-1100 Ribbons Black £5 Colour £11
- VM 800 Toner Cartridge (8000 pgs) £105

Hewlett-Packard Printers

DeskJet 500	£255
DJ550 colour	£459
QuietJet plus	£399
DJ Portable	£283
DJ500 colour	£355
Desk Jet 510	£265
Desk Jet 1200C	£1085
Paint Jet	£495
PaintJet XL300	£1779

3 years on-site maintenance available as follows:

DeskJet & DeskWriter mono	£55
DeskJet & DeskWriter colour	£65
• Paintjet Cartridges Black	£15
Colour	£23
• DJ Portable CSF	£49
Carrying Case	£49

Desk Jet 500 Accessories

- 256K RAM Cartridge £69
- Epson FX Emulation Cart. (500 mono); £45
- Ink Cartridges Black **£14**; Colour £23
- High Capacity Black Ink Cartridge £21
- Black Ink refill Double Pack £9
- DJ500 Colour Archimedes Printer Driver £15
- Dust Cover £6
- DJ500C/550C Archi Printer Driver £15
- 636G 50 x Transparencies A4 £40
- 636J 50 x Glossy Paper A4 (also XL) £40
- 630Z 50 x Cut Sheet Paper A4 £15

HP Paintjet/XL Accessories

- **630P** 200 Z-Fold paper 8.5 x 11 £14
- **630Q** 50 Transparencies 8.5 x 11 £39
- **630S** 50 Transparencies A4 £40
- **630Y** 200 Cut Sheets 8.5 x 11 £14
- **631Y** 200 Cut Sheets A4 £18

Plug In Font Cartridges for DJ 500

- 22706B – Prestige, Elite, Line Draw fonts £55
- 22706C Letter Gothic & HP Line Draw fonts £56
- 22707P – Proprint Emulation Cartridge £57
- Desk Jet Unlimited (Book No VAT) £19.75

Canon Bubblejet Printers

	Printer	CSF	2nd Bin	Ink Cart
BJ10EX	£162	£43	–	£16
BJ10SX	£175	£43	–	£16
BJ200	£274	–	–	£16
BJ300*	£335	£88	£88	£12
BJ330*	£373	£110	£79	£12
BJC800C	£1345	–	–	£16

* Includes 12 months On-site warranty

- Spare Battery pack for BJ10E £33
- BJ10EX & BJ20 Turbo Driver £42
- BJC800 Archi Turbo Driver £89

Roland Plotters

- DXY1100 £499
- DXY1200 £649
- DXY1300 £869
- Sketchmate A4 £308
- Sketchmate A3 £475
- HP7440 £665
- HP7475 £899
- HP7570 £2015
- HP7575 £2529
- Roland plotter Pens, Fibre tip £7.50

Epson Printers

	Printer	CSF	Ribbon
EX1000C	£428	£–	£6
FX870	£273	£47	£4
FX1170	£339	£69	£6
LQ100	£148	£–	£4
LQ570+	£205	£47	£4
LQ870	£359	£47	£6
LQ1060	£585	£155	£6
LQ1070	£310	£69	£6
LQ1170	£434	£69	£6
LQ2550	£673	£360	£6
LX100	£116	£–	£4
LX400	£94	£69	£4
LX850+	£135	£69	£4
LX1050	£203	£125	£6
SQ870	£409	£59	£23
SQ1170	£560	£155	£23
SQ2550	£669	£–	£23
Stylus 800	£244	£–	£10

RS232 Interface Standard	£28
+8K Buffer	£75
Tractor Feed for:	
LQ100	£29
FX850/LQ800/850	£69
FX/LQ1050	£85
LQ2500/2550	£90

- Dustcovers for Epson 80 col printers £6

Accessories

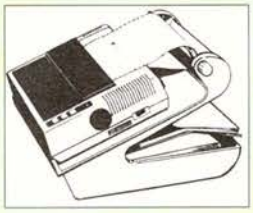
- EX800/1000 Colour Option £45
- EX800/1000 Colour Ribbon £14
- Multifont Card for LQ550/850/1050 £95

Listing Paper (Perforated)

- 1,000 Sheets 9.5" x 11" Fanfold Paper £7
- 2,000 Sheets 9.5" x 11" Fanfold Paper £11
- 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold £21
- 1,000 Sheets 15" x 11" Fanfold Paper £9
- 2,000 Sheets 15" x 11" Fanfold Paper £16
- 1,000 Sheets true A4 Fanfold Paper 70gms £11
- 2,000 Sheets true A4 Fanfold Paper 70gms £21
- 500 Sheets A4 80gms Bond £3.50

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Professional Printer Stand



The professional printer stand takes hardly more space than your printer. Due to the positioning of the paper feed and re-fold compartments ie. one above the other, the desk space required for your printer functions is effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £19
132 Column version £29

Printer Labels

(On continuous fanfold backing sheet)

1,000 off, 90 x 36mm (Single Row)	£6.00
1,000 off, 90 x 36mm (Twin Row)	£6.25
1,000 off, 90 x 49mm (Twin Row)	£7.50
1,000 off, 102 x 36mm (Twin Row)	£6.75

Laser Printer Labels on A4 Sheets

3750 off, 70 x 29mm (3 Rows x 10)	£15.50
2400 off, 70 x 37mm (3 Rows x 8)	£15.25

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
BBC B/BBC Master	–	£4.00
Archimedes Micro pair	–	£9.00
Citizen 120D	£3.25	£5.00
EX800/1000	£6.00	£6.00
RX/FX80/85/800/MX80	£2.95	–
FX/MX/RX100/1000	£3.95	–
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£5.50	£6.00
LQ1050/LQ2500	£12.00	£6.00
LX400/800/850	£3.50	£6.00
M1009/GLP	£2.95	£6.00
NEC P2200	£4.50	£6.00

Dust covers for most 80 column printers available at £6 each

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 printers to 1 Micro with our combined, Sharer/Changer switch boxes.

Standard Low Cost Type

Connects	Serial	Parallel
• 2 to 1	£10	£10
• 3 to 1	£14	£15
• 4 to 1	£19	£20

Professional Type

Connects	Serial	Parallel
• 2 to 1	£15	£16
• 3 to 1	£20	£23
• 4 to 1	£30	£34

Cables from £5 each (see cable section)

Cross Over Manual Switch

2 In/2 Out Parallel	£29
2 In/2 Out Serial	£28
3 In/2 Out Serial	£36

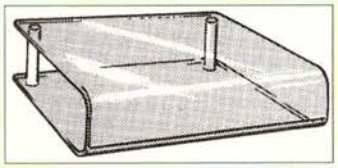
Auto Printer Sharer

Connects	Serial	Parallel
2 to 1	£34	£36
4 to 1	£52	£53
8 to 1	–	£85

Compact Converter Units

Serial to Parallel	£32
Parallel to Serial	£32

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

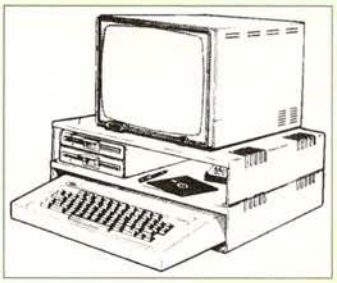
80 Column version	**£16** (carr £3)
136 Column version	**£20** (carr £4)

256k Multi Spooler

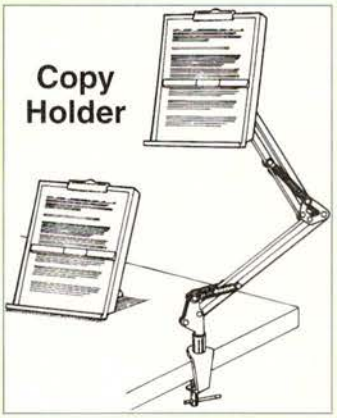
These Auto Parallel Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

- 2 In/2 out **£125**
- 4 In/2 out **£139**
- 8 In/1 out **£185**

Plinths for the BBC Master and A3000



- Single Master Plinth 490 x 310 x 105mm £14
- Double Master Plinth 490 x 310 x 210mm £26
- A3000 Single Plinth (very sturdy & precision made), has a slot on the left for the switch & cut out on the right for 3.5" Disc Drive £15



Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly be means of a plastic retaining ruler and a clip grip.

Desk Top **£8**
Angle poise **£12**

NEW

Copy holders as above but with a battery operated, remote controlled cursor/ruler. (By hand or foot pedal.) (Batteries 2 x AA not included.)

Desk Top **£15**
Angle poise **£20**

Servisol Foam Cleaner

This king size multipurpose foam cleaner spray is ideal for cleaning Keyboard, Monitor, Disc Drive & Computer furniture surfaces.

£2.50

Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

£2.50

Continued→ → → → → →

QUEST MOUSE Mk III

- Quest Mouse III & Quest Paint £49
- Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £69
- Quest Mouse III only £25
- Quest Paint Software only £28
- Quest Font Disc (22 Text Fonts) £15
- Quest Mouse Mat (Red or Blue or Green please specify) £3
- Conquest (Quest Paint Extension) ROM £24
- Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18

(P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

Mouse Cleaning Kit

To obtain trouble free operation and prolong the life of your mouse, the high tech rodent requires regular cleaning. Our deluxe mouse cleaning kit is ideal for the purpose £3

Archi Mouse Port Splitter

Our handy little splitter unit eliminates the risk of damaging your micro due to constant plugging and unplugging of the mouse by allowing you to connect both, a joystick and a mouse simultaneously to your Archimedes. £15

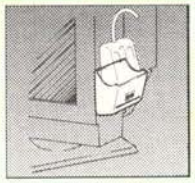
Mk III AMX MOUSE

- **AMX Mouse plus Super Art £49**

(Please specify for BBC, Master or Compact)

- AMX MOUSE ONLY £25
- AMX SUPERART Package £24
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £20
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £29
- AMX EXTRA EXTRA £16
- MOUSE MAT £3

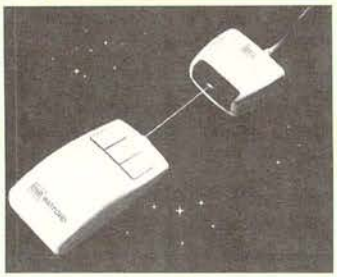
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive etc.

Only £3

Archi Cordless Mouse



Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 minutes inactive
- Auto Power Shut-Down after 20 minutes inactive

Price £32

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.

QT-10 BBC/Master Version £25
QT-20 Archimedes Version £26

Beeb Hand Scanner

Watford Beeb HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs!

Beeb HandScan & Firmware £99

Archi Mk II Hand Scanner

Watford's Mk II hand scanner has a maximum resolution of 400 dpi. The scanning width is 4". The sophisticated software is supplied in a 64K ROM, located on a standard single width expansion podule. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. Other facilities include Cropping and scaling to any size including stretching and squashing in X and Y directions separately. Colour tinting. X and Y flip. Edge detection which turns solid objects into outlines. Images can be printed on any printer supported by RISC OS.
On-screen help is provided via the RiscOS interactive help facility. (Please write in for full technical details).

AHS-4 Archi 300/400 Version £109
AHS-3 Archi A3000 Version £119

Award winning Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Wapping Editor Software Pack £49
Wapping Editor plus Mouse £69

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out. £15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor.
Also included are two Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines.
Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only). £13

Archi A4 Scanner

The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures. Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.
Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

Archi A4 Scanner £239
Sheet Feeder for above £75
Scanner + Sheet Feeder £309

Z88 Portable Micro

- Z88 Portable Micro £POA
- 32K RAM Pack or 32K EPROM Pack £16
- 128K RAM Pack or 128K EPROM Pack £32
- 512K RAM Pack £86
- 256K Eprom Pack £55
- Z88 Eprom Eraser Unit £38
- Z88 Carrying Case £8
- AA Nicad Rechargeable Battery £1.50
- Battery Charger Compact & Fast £6
- Z88 Serial Printer Cable £8
- Z88 Parallel Printer Cable £18
- Z88 to BBC Link £8
- Z BASE £49
- Z88 to PC Link II £27
- Z88 to Macintosh £32
- Z88 Mains Adaptor £9
- Z88 Modem £99

Psion Series III

Psion Series III Computer

- Series 3 128K £155
- Series 3 256K £179

RAM Solid State Discs (SSD)

- 128K £68
- 512K £170
- 1Mb £255

Flash Solid State Disc (SSD)

- 128K £34
- 256K £59
- 512K £102
- 1Mb £170
- 2Mb £255

Communications

- Parallel Interface Link £25
- RS 232 Serial Link for PC £58
- RS 232 Serial Link for Mac £59

Various

- Mains Adaptor 9V AC £12
- Spreadsheet £59
- Professional Finance £42
- Spelling Checker/Thesaurus £42

HP Palmtop PC

- HP95LX 512K Palmtop PC £199

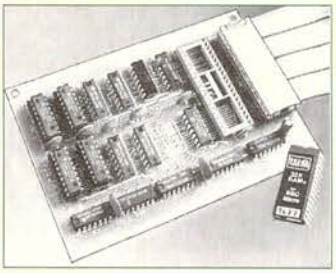
P.S. Above price includes Lotus 123, Desk Diary and Memo softwares in ROM

- HP Connectivity Pack £55
- HP95LX 512K RAM Upgrade £POA

Fax Machines

Brother 305#	£335
Brother 450#	£375
Brother 550M#	£455
Canon 170	£520
Pana UF121	£320
Pana UF128M	£415
KX F2090BE	£488
Tosh TF132	£349

32K Shadow RAM/ Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

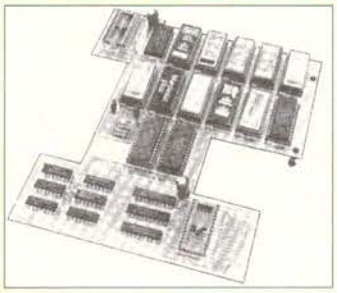
Simply plug the ribbon cable plug into the 6502 socket and gain a massive 32K of extra RAM.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28K bytes free – 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

Only £49

Solderless Sideways ROM Socket Board



- Increases your BBC Micro's ROM capacity from 4 to 16.
- **No soldering required.**
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish" allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only £32

Battery Backup fitted **£35**

Battery Backup only **£3**

16K Sideways RAM **£8**

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: £8

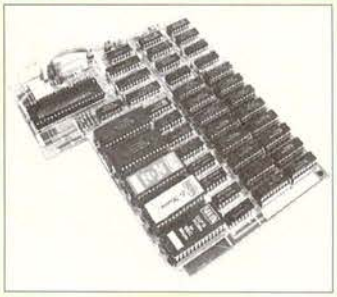
Watford DATA DUCK

Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK £8

ROM/RAM Card



- No Soldering required to fit the board.
- Compatible with BBC B
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).

PRICES:

- ROM/RAM card with 32k DRAM **£39**
- ROM/RAM card with 64k DRAM **£52**
- ROM/RAM card with 128k DRAM **£83**

OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit **£8**
- 16k DRAM for Upgrade **£13**
- Battery backup **£3**
- Read and Write protect switches **£2 each**

Complete ROM-RAM card with all options fitted **£99**

ROM Cartridges for the BBC Master

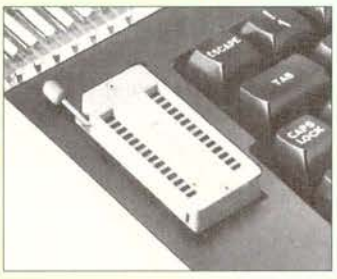
Will accept the larger Piggy Back ROMs like Interword, Quest, etc.

• Twin **£9**; • Quad **£14**

Access VISA AMERICAN EXPRESS

24-Hour Credit Card Order Line (0923) 233383 or 250234

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without having to open the lid. The ZIF socket is located into the ROM Cartridge's position. It is very simple to install. No soldering required. Also included in the price is a plastic see through storage case with antistatic lining, which allows you to store 12 ROMs. **£18**

Leasing finance now available at very attractive rates to Businesses (subject to status), Education establishments, Government Depts. and Local Councils. Min. £1000. Please telephone for details.

Computer Concept's ROMS

Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42
Wordwise Plus	£38#

Price includes a FREE Wordaid Rom

Word-Aid

This advance utilities ROM extends the power of your Wordwise plus ROM.

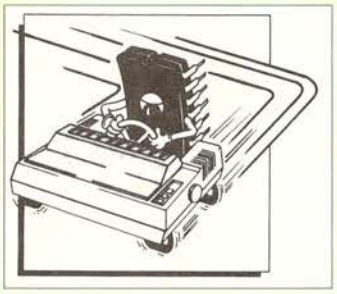
Only **£24**

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
Viewsheet (Acornsoft)	£36
Viewstore	£36
Viewspell – 80T disc	£25
View-Index	£12

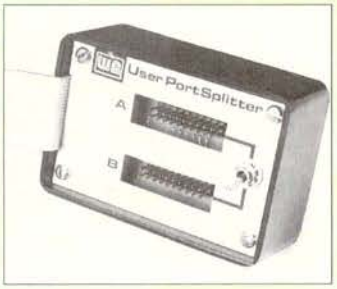
View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

Price: Only £29

User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows you to connect two devices simultaneously to the BBC's user port.

Excellent Value at **£22**

VISA Access AMERICAN EXPRESS

CREDIT CARD 24 HOUR Ansaphone Hot Lines (0923) 250234 or 233383

Assorted ROMS

ACORN ADFS	£25
ACORN BASIC 2 plus User Guide	£22
ACORN DNFS	£17
Acorn OS B+	£25
Acorn OS 1.2	£14
Beebmon	£22
Dump Out 3	£25
Graphics Extension Rom GXR-B	£21
GXR-B+	£22
Logotron LOGO	£43
MASTER OS ROM	£38
Master ULA (47)	£15
Master ULA (60)	£10
Numerator – Archi	£69
Numerator – BBC	£39
Pendown ROM	£32
SERIAL ULA	£13
TED	£25
Video ULA	£14
1Mb OS ROM	£39

Watford Electronics' New High Tech Computer Boutique is now open in Luton.
Don't miss your chance to visit the Acorn Village.

CHIP SHOP

1 MB-10 DIL D-RAM	£4.50
1 MB ZIF D-RAM	£4.00
256K x 4-8 DIP	£4.75
256K x 4-8 ZIF	£4.00

Memory SIMs

• 256K x 9-7	£9	• 1Mb x 9-7	£29
• 256K x 9-8	£9	• 1Mb x 9-8	£33

Various Chips

DS3691	£4.50		
DS88LS120	£5.25		
LM324	£0.45		
SN76489	£5.50		
SAA5050	£8.75		
UPD7002	£6.00		
2764-250nS	£3.00		
27128A-250n (12V5)	£2.50		
27128-250nS (21V)	£4.00		
27256-2	£3.00		
27512-2	£4.50		
27C101G (1 Meg)	£7.00		
• 4013	75p	• 74LS00	50p
• 4020	£1.00	• 74LS04	50p
• 4164-10	£1.55	• 74LS10	50p
• 4464-10	£3.50	• 74LS123	£1.00
• 4816 RAM	£2.00	• 74LS163	£1.00
• 41256-8	£2.00	• 74LS244	£1.00
• 41256-10	£1.50	• 74LS245	£1.00
• 6264LP-8K	£4.00	• 74ALS245	£2.75
• 6502A	£5.00	• 74LS373	£1.00
• 6522	£4.00	• 74LS393	£1.00
• 6522A	£5.00	• 75159	£3.00
• 62256ALS	£10	• 8271	£30
• 62256P-12	£8.50	• 9637	£2.00
• 7438	50p		

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer

Special Offer £10

Commander Joystick

Features:

- Direct connection to BBC Analogue input port –
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Price: £15

Voltmace Joysticks

Delta 3B Single Joystick	**£10**
Delta 3B Twin Joysticks	£15
Delta 14B Single Joystick	£11
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24
Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128	£25

ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

- Plastic Chip Extractor **£2**
- Metal Chip Extractor **£3**

TEX EPROM ERASERS

Over erasure of EPROMs very rapidly turns them into ROMs!
The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER GT** – Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£36**
- Spare UV tubes. **£12**

OFFICE MASTER

- CASHBOOK • FINAL ACCOUNTS
- MAILIST • EASILEDGER –
- INVOICES & STATEMENT

All this for only **£21** (Disc)

OFFICE MATE

- DATABASE • SPREADSHEET
- BEEBPLOT

Only £10 (Disc)

Spares for BBC Micro

UHF Modulator	£4
Speaker **£3;** Speaker Grill	£1
Keyswitches	£1
16MHz Crystal	£2
17.734 MHz Crystal	£2
32.768MHz Crystal	£2
Replacement 17 way Flexible Keyboard Connector	£4
BBC Master Power Supply	£69
BBC Master Keyboard	£62
BBC Master Casing	£49
Refurbished BBC B Spares	
BBC B Casing	£19
Clear Perspex Keystrip Holder	£3
BBC B Keyboard	£35
BBC B Power Supply	£49

Spares for Archimedes

A3000 PSU	**£49;**	Disc Drive	£59
Controller VIDC	**£39;**	MEMC	£29
I/O Controller			£39
ARM 2 CPU			£39
A400 Disc Drive			£59
Fan Filter			£6
A300/400 PSU	**£89;**	Keystrip	£5
A300/400 Keyboard			£120
A300 Disc Drive			£89

Aerosol Dust Spray

Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces. **£3**

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW & WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus – Mastering	£13.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Reference Manual	£29.00
A5000 Technical Reference Manual	£–
Acorn DTP A Guide to	£17.00
Advanced User Guide for BBC	**£10.95**
Archimedes 1st Step – Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes Basic V Guide	£9.95
Archimedes BBC Basic Guide	£20
Archimedes DTP Manual	£10.00
Archimedes Game Maker Manual	£14.95
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference Manual	£79.00
Assembly Language Quick Ref.	£21.95
BBC B Micro User Guide	£15
Budget DTP on the Archimedes	£12.95
C Big Red Book of	£8.95
C_Dabhand Guide to 3rd Ed	£16.95
C Programming Lang. 2nd Edition	£24.95
DISC FILING SYSTEM (DFS) Operating Manual for BBC	£5.95
DTP on the Archimedes	£12.95
File Handling for All	£9.95
FORTH on the BBC Micro	£9.95
Graphics on the ARM	£14.95
Impression – Dab Hand Guide	£14.95
ISO-PASCAL Reference Manual	£9.95
Master 512 Guide – Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual – Advanced	£14
Mouse User Guide to BBC Micro – the Complete	**£5.95**
Example Programs on Disc for above	**£4.95**
Mysteries of Disc Drives & DFS Revealed	£4.95
PASCAL Programming	£10.95
Risc OS Style Guide	£9.95
RISC Technical Manual 260 pg	£14.95
Understanding Interword – A Beginners Guide	£4.95
View 3.0 User Guide	£10
Viewsheet User Guide	£10
Viewstore User Guide	£10
Wimp Programming for All	£12.95
Z88 – A Dabhand Guide	£14.95
Z88 Computing	£9.95
Z88 Magic	£14.95

ACORN to PC

Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way – from Acorn to MS-DOS, or from MS-DOS to Acorn.

Price: £6.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you.

Only: **£9.95** (No VAT)

Beeb PC (BASIC)

Designed for program authors to convert BBC programs to run on IBM PCs.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

Beeb DOS is a collection of utilities which run on the PCs and enable it to read and write information on BBC Discs.

Price: £39

The Epson RX/FX Printer Commands Revealed Handbook

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.
However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.
Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.
This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

£4.95 (No VAT)

- Official orders accepted from government, educational establishments and PLCs.
- Shop Hours: 9am to 6pm, Monday to Saturday. Late night Thursday until 8pm. Free customer car park.
- Mail Order Inquiries: 9am to 6pm. Monday to Friday only
- Technical Inquiries: 9.30am to 5.00pm, Monday to Friday

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	1st Item	2nd & Sub-sequent Item
Software	£7.00	£2.00
Hardware	£8.00	£5.00
Lasers	£10.00	£7.00
Accessories	£5.00	£3.00
Small Items	£5.00	£3.00

P.S. Many software packages qualify for the small item tariff

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Established 1972

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VAT: UK and EC customers: Please add 17.5% VAT to the total cost, including carriage.

Putting a system into your fonts

This month Pam Turnbull covers the whys and wherefores of !System and !Fonts

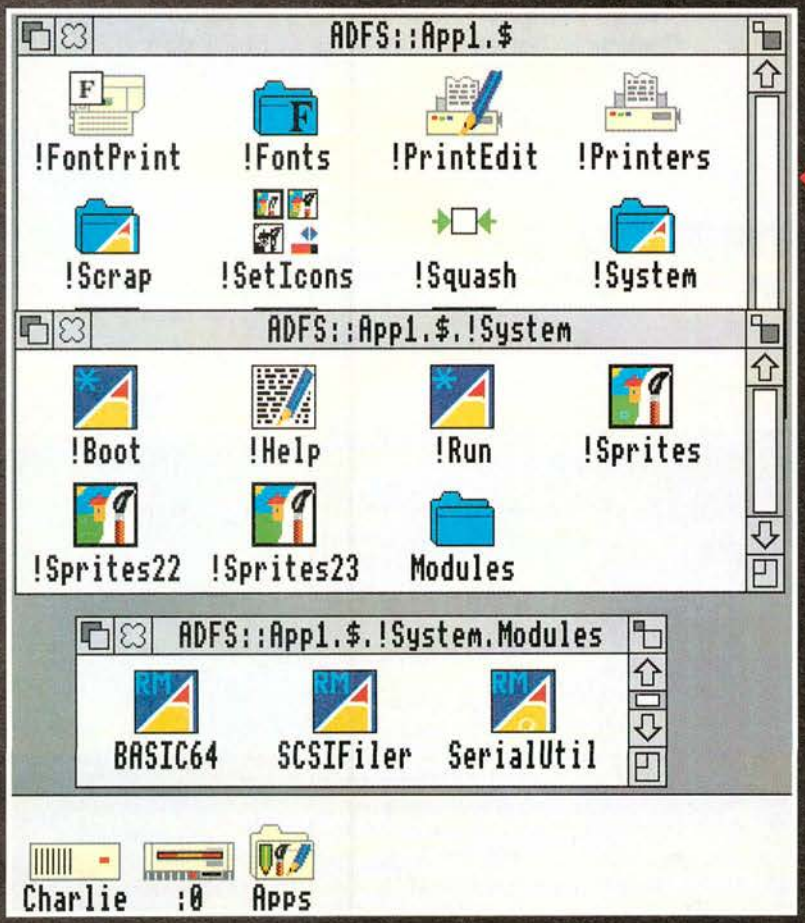
WHEN you first buy your Acorn you receive a couple of Application disks containing programs some of which are interesting, some useful and three in particular which are vital – !Printers, !System and !Fonts on Applications Disk 1.

If you buy a machine with a hard disk, the programs are in two directories called Apps1 and Apps2. We covered printers last month, so this time we'll go through the simple procedures to ensure that your System and Fonts directory are set up the best way.

The first thing to do is to copy !System, !Scrap – this is rarely updated but should always be kept alongside !System – and !Fonts to the top level of your hard disk or on to two floppy disks. One will be your Master System Disk and the other your Master Fonts Disk. Put your original Applications disks somewhere safe.

When you start a new session with your computer – at switch on or after pressing Control+Break or Control+Reset – the computer should *see* the !System and !Fonts applications.

If you have a hard disk, just click on the hard disk icon to bring up the *root* (top level) directory which should contain !System and !Fonts. With floppies insert each disk in turn and click on the drive icon.



1 Hold down the Shift key and double-click with Select. This will reveal seven icons:

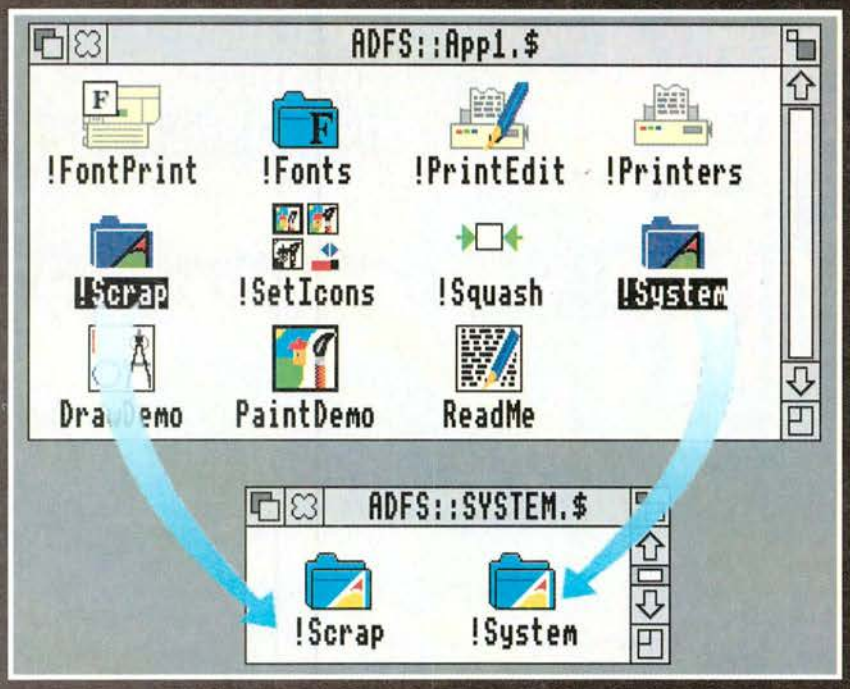
!Boot/!Run These contain various bits of set-up information.

!Help Tells you that some programs require different modules from time to time

!Sprites/!Sprites22/!Sprites23 The icons needed for different screen modes.

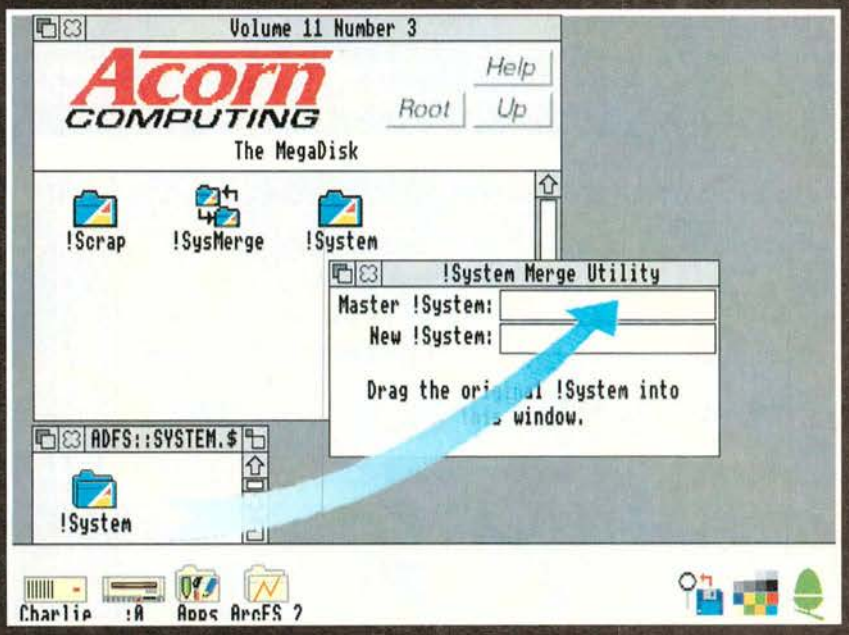
Modules If you open this you'll find the various ***R***elocatable ***M***odules – hence the *RM* – which different programs will need.

New and updated modules are released from time to time which is why some commercial programs come with a utility called !SysMerge and their own !System folder containing modules you'll need to run the program. Always use !SysMerge when you find it before running the next program.



2 Having copied !System and !Scrap to a disk, add !SysMerge – you'll find a copy on this month's cover disk. We're now going to add the modules CLib, Colours and FPEmulator to your master !System disk. If you're using a separate floppy disk give it the name *System*.

You should have your master System disk and the MegaDisk. Put the MegaDisk into the drive and double-click on !SysMerge. You'll be asked to drag your master !System into the window. Replace the MegaDisk with your System disk, open and drag the !System from it into the window as directed.



3 Next you'll be prompted for the new !System. So put the MegaDisk back in the drive and drag !System from it. This will involve a bit of disk swapping.

!SysMerge will only overwrite old versions of modules and as you have your !System on a separate floppy there is no space problem which you might have if you try to squeeze extra modules on to your Applications Disk 1.

Where to get additional fonts from

	Acorn dealers
Acorn Computers	
Dec_Data	0392 221702
Design Concept	031-668 4518
Electronic Font Foundry	0344 872923
Hampshire Microtechnology Centre	0705 378266
ICS	051-625 1006
Longman Logotron	0223 425558
Matt Black	0733 315439
Risc Developments	0727 40303
Wyddfa Software	0286 870101

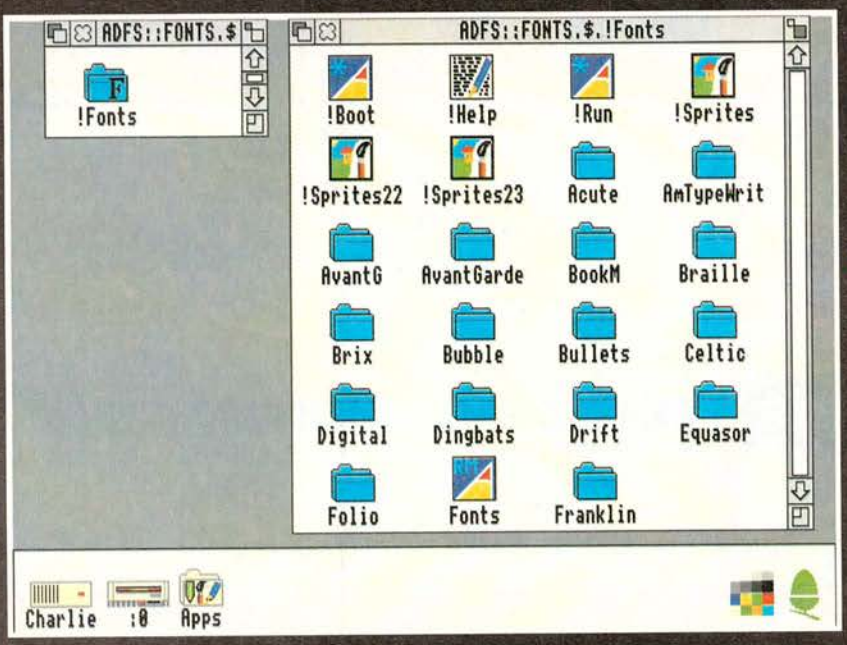
Fontastic access

People with Risc OS 3 have more flexibility when it comes to Fonts than those with Risc OS 2 as Trinity, Corpus and Homerton fonts are built into the rom so are always there when you turn on, as is the Outline Font Manager.

Those with Risc OS 2 machines need to keep all this information in a !Fonts directory on their hard disk or on a floppy Master Fonts disk.

If you hold down the Shift key while double-clicking the !Fonts directory you'll find a selection of files and blue folders with names such as Portrhouse, Selwyn, Sidney and System. These are the fonts.

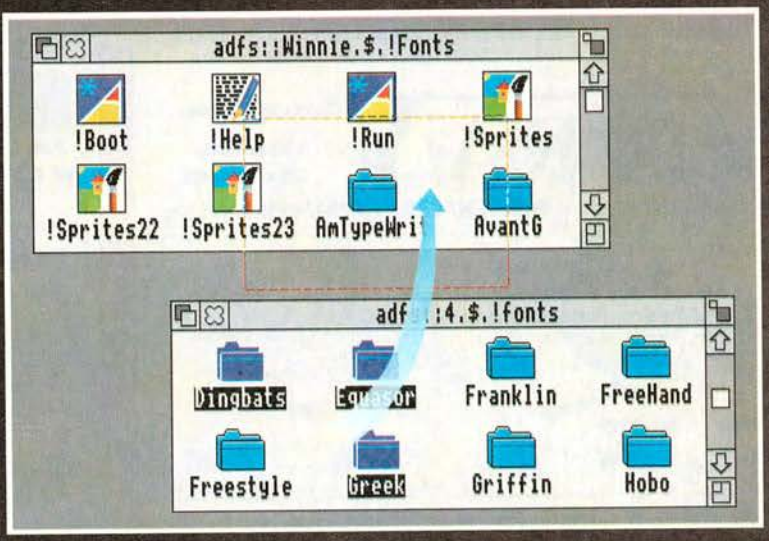
If you have a hard disk just drag the !Fonts directory on to it. If you're using a floppy disk format it, call it Fonts and drag !Fonts on to that. There'll be a bit of disk swapping involved again.

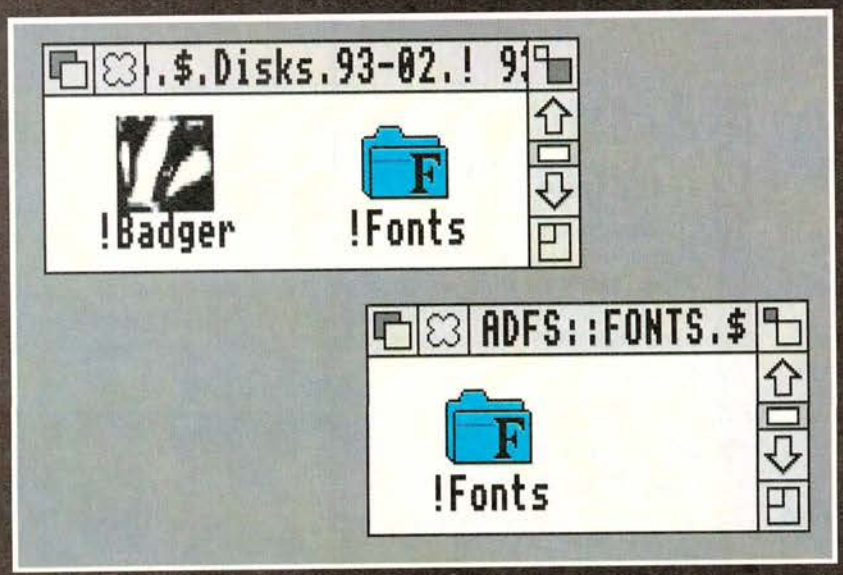


4 Some companies want their programs to use certain fonts and so supply a !Fonts directory. Unfortunately adding the new fonts is not quite as simple as updating !System because there's no official !FontMerge program.

5 So, to update your !Fonts, Shift+double-click on it to open it up, and move the window to the top of the screen to avoid confusion. Put in the disk with the new fonts and Shift+double-click on its !Fonts as well.

Now select one of the blue font folders in the new window and drag it up into the original font window. If you're using floppies you'll be prompted to swap disks. Repeat for each font directory – or you can do a multiple select using the Adjust mouse button and drag all the folders in one go.





6 A particularly useful aspect to Risc OS 3 font management is that you can have many font directories holding different types of fonts. For instance, if you use a lot of foreign language programs you might like to keep all your fonts together. Or you could create a special Fonts Disk for a child to contain all the fonts used most in education programs, and ones that are easier for children to read such as Jotter, Junior or Primary.

To add the fonts in the new directory you just double-click on the new !Fonts and the font manager will supply those as well.

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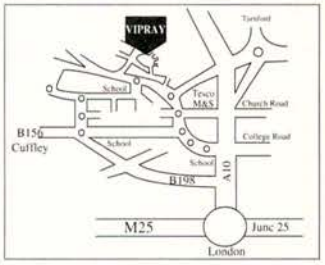

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£1,000 digitiser competition — the ultimate expansion

JUST as computers are for everyone, so is the ability to digitise real-life pictures from any source. There are different solutions for different pockets and HCCS specialise in providing quality hardware at a budget price. The range starts at £50 but built into the packages is the ability to upgrade.

So whether you are taking pictures from TV, camcorder or video you can access them on any Acorn 32-bit machine with the exception of the A4. The mono version is not supplied for the Ultimate Expansion System but you can always upgrade at a later date if you find you need colour or HiVision colour.

What's on offer

First prize – worth £256
HiVision Colour Digitiser fitted to an Ultimate MultiPodule PLUS a SCSI card for the Ultimate Expansion System.

This real-time colour digitiser processes images in mono or high resolution colour with an image size of 508 lines by 729 pixels and has a four frame per second Viewfinder.

Second prize – worth £209
Vision Colour Digitiser fitted to an Ultimate MultiPodule PLUS a SCSI card for the Ultimate Expansion System.

Again it processes both mono and colour images and its 6 digitised bits are expanded to 24 when signal processing in colour.

10 Runners up prizes – worth £57
Mono Vision Digitiser which fits internally in your 32-bit machine.

The image size here is 254 lines by 640 pixels giving you access to 256 greyscales. As with all of these models you can digitise in real-time and adjust colours to their best advantage.

What to do

To win one of these superb digitisers all you have to do is make as many English words as possible out the words Ultimate Expansion. Attach your words to the entry form below and make sure it reaches the *Acorn Computing* offices before June 30.

Name _____

Address _____

_____

_____

Postcode _____

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Age _____

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☐ A3000 ☐ A5000
☐ A3020 ☐ A300 series
☐ A4000 ☐ A3010
☐ A400 series

Now send your completed entry form to:

HCCS Competition, Acorn Computing, Europa House, Adlington Park, Macclesfield SK10 4NP.

More games advice

FIRST let me congratulate you on the new look magazine. However, there are a couple of items which let it down by their notable absence. Why is it that HacMan and the Mad Hatter only have bi-monthly articles, that is when they are present at all?

These are among the main reasons I buy your magazine, even though I don't own an Acorn computer! Also would it be possible to extend the number of letters to occupy four pages instead of the usual two? – **R.Hunt, Norwich, Norfolk.**

● *I'm glad to hear that you enjoy HacMan and Mad Hatter but at present we have no plans to extend their pages to four. The reason for this is space – there are never enough pages in the magazine to hold all the articles we want to print.*

Discovering fonts

WITH the advent of Risc OS 3 it has become very simple to make an Oblique – not Italic – version of any font. In fact, this is what Acorn do with the Homerton and Corpus fonts in rom.

Simply open the directory of the font you wish to process and create a new directory named Oblique. Into this Oblique directory copy the IntMetrics from the parent.

Now load this file into Edit and set overtype (Shift-F1). The first characters in the file are the font name – add .Oblique to this and save the file. Now click menu on Apps and Open $. Open Fonts.Homerton.Medium.Oblique and load the text file Outlines into Edit.

Change the words Homerton.Medium to the name of the font on which you are basing the new oblique on – Clauch for example – and save as Outlines along with the IntMetrics file.

The new font Clauch.Oblique has now been created. Double click on !Fonts and it should be available for use.

The same method can also be used to free disk space if you already have some Oblique fonts. Simply delete the Outlines file and replace with a text file as described above. Make sure you have a backup of the original first.

The six numbers in the Outlines text files operate on and alter the parent font as follows: Width, Rotation, Italic angle (shear), Height, Horizontal offset, Vertical offset.

I have no idea what the \M after the font name is for, or what units the numbers are in, but why not have a play around? – **S.Parkin, Ossett, West Yorkshire.**

Got it taped

IN September 1989, *Electron User* printed a tape-to-disk program in reply to a letter. It worked for the Electron ADFS drive with Page at &1D00, automatically transferring tape to disk and it should work with DFS if line 140 is changed to *Disk.

Each program is *LOADed from tape and immediately *SAVEd to disk at an address above disk work space. It was quite useful in transferring *Electron User* tapes when I fitted a disk drive.

Perhaps it will work with the BBC computers as long as the addresses in the program are correct for the BBC. – **E.F. Kelly, Roby, Merseyside.**

```
10 REM
20 REM tape->disk
30 MODE6
40 VDU28,0,24,39,15
50 HIMEM=&72B8
60 *FX16
70 *Tape
80 *LOAD "" 2000
90 A%=0
100 REPEAT
110 n$=n$+CHR$(A%?&3B2)
120 A%=A%+1
130 UNTIL A%=11 OR A%?&3B2=0
140 *ADFS
150 n$="SAVE "+n$+" 2000 +"+STR$~(?&3C
6*256+(!&3C8 AND &FFFF))+" "+STR$~(!&3
C2)+" "+STR$~(!&3BE)
160 PRINT'"*";n$'
170 OSCLI n$
180 CLEAR
190 GOTO 70
```

PC gameplay

I HAVE a 2Mb A3000 with PC Emulator v1.6. I have recently noticed the high standard of the PC games, so I wondered if I could play PC games using the Emulator.

I looked in the manual to see if you could but I couldn't find anything. I asked my dealer and he said that the PC games would not work properly.

The other day I met a technician from my school who deals with the A310s, A3000s and A5000s and I asked him and he said some will work. Now I am very confused, so please can you tell me if I can play some PC games and if so which ones? Also will be they slower or faster than they should be? – **S. Clapham, 26 London Road, Liphook, Hants GU30 7AN.**

● *As a rule of thumb if you are emulating a different computer system it will run slower than the original. The PC Emulator is pretending to be a 286 PC and as such is very successful. However, most PC games these days need a 386SX as a minimum – they also often need a hard disk and VGA graphics. So both pieces of advice you received were correct.*

The best way to run PC games – or any

Sounds useful

SOUND sampling is a luxury beyond the budget of the average Archimedes owner, but recently I found a a way to get sampled sounds easily using the Apple Mac's sampling facilities.

You'll need:

- Access to an Apple Mac with System 7
- Mac to PC disk reader – PC Access or Apple File Exchange
- Microphone or pair of headphones with a standard 3.5mm jack plug
- Archimedes to PC disk reader – MultiFS, !SampConv or DS Edit

Go to the sounds control panel on the Mac and click on the *Add* icon. Plug in your microphone or headphones which can be used as a microphone and test it by speaking into it. The Mac will respond to sound by flashing the speaker icon. Now record your sound, being careful to click stop as soon as you've finished.

A second of sampled sound takes up around 25k so be economical. Give it a short name and save. Staying on the Mac go to the System folder where there should be another folder marked System – the icon is a briefcase with an apple on it.

Copy out the sound you have just saved into the top level of the hard drive as it is more convenient to work with there. Then, using the Mac to PC disk reader, transfer on to a PC disk.

Take this to your Acorn machine and load the Arc to PC disk reader although A3010/20, A4000 and A5000 owners will be able to read the disk without this additional reader. Also load !SampConv which is a PD utility or something similar.

The sounds are in *8-bit linear unsigned* format so resave the sample as a DSEdit file and load into DSEdit to edit out the white noise at the beginning and end. Resave the file and there you have it. – **Matthew Bloch, Headington, Oxford.**

● *Yes it works, but Apple Mac IIci and Mac IIcx machines don't allow you to add sounds.*

However, as long as they have System 7 you can take some of their built-in sounds and convert them to your Acorn 32-bit machines.

People without Mac access can create their own effects using the Oak recorder which retails for about £30.

serious PC usage – is via a PC card such as the one from Aleph One, which sits inside or alongside your Archimedes. However, even an Aleph One card doesn't guarantee complete compatability.

But remember, PC games are very hungry on ram and hard disk space so read all the requirements on the PC box before you part with any cash.

Getting organised

I HAVE had my A310 upgraded at last and wanting to start with some semblance of order I tried to follow an article from August 1992.

I think I followed your instructions but I cannot get the IDEFS to autoboot and am uncertain how to get the iconbar Acorn ! autoboot icon programmed into my !System. – **Jean Higham, Fallowfield, Manchester.**

● *The solution is simple. Click Menu on the Task Manager (the Acorn) and drag the !boot icon into the root directory of your IDEFS hard disk – the top level, $ directory. Press F12 to access the command line and type the following:*

```
*Configure IDEFS
*Configure drive 4
*IDEFS:OPT 4 2
*Configure boot
```

Then press Return twice to return to the desktop.

A love of programming

IN REPLY to 10-year-old Matthew Jack's letter in the March issue, yes there are others out there who love programming their BBC Master for the enjoyment of it – I am one of that breed.

I started when I was 7 and at 18 I am still enthused by the challenge of writing good software and in exploiting the enhanced facilities of the Master.

Enthusiastic BBC programmers are few and far between since the Archimedes – so many of them easily swayed to the tempting omnipotent Archi.

The BBC is still alive and I for one will do my utmost to keep it alive as all too often you see programs written by programmers who are not putting any enthusiasm into their programs.

Here is my idea of a good seven line type-in utility to search through a collection of disks for a named program. It has been of great use to me over the years as I have accumulated masses of disks with programs strewn everywhere on them.

Run the program and it will ask for the name of the file to search for and the drive surfaces which it should use:

```
10 REM File Search
20 REM By Mark Bannister 1993
30 DIM D(3) :ON ERROR CLS:END
40 MODE7:CLOSE#0:INPUT"Filename:"F$':FOR
I=0TO3:PRINT"Search drive ";I;"?(Y/N) ";
:A=GET:PRINTCHR$A:=A-78:D(I)=A:NEXT:PRIN
T''"<SPACE> to start search.";:REPEATUNT
ILINKEY-99:OSCLI("DI.")
50 CLS:PRINTCHR$136;"Searching...";:FORI
=0TO3:IFD(I)<>11THEN60ELSEOSCLI("DR."+ST
R$I):X=OPENUP(F$);CLOSE#X:IFX>0K=I:I=4
60 NEXT:VDU7,12:IFX>0PRINT"File found on
 disk in drive ";K:END
70 PRINT"File not found - change disk(s)
."''"<SPACE> to resume. <ESCAPE> to end.
";:REPEATUNTILINKEY-99:GOTO50
```

– Mark Bannister, Wandsworth Common, London.

● *Could Matthew Jack please contact us with his current address as we have some letters to pass on to him?*

Namesakes

I HAVE noticed something on Risc OS 3.1 when I am in the Switcher/Task Manager menu. Inside its info sub menu there is a copyright line *Acorn Computers 1992.*

If you click on the letters T E A M in these words with Select and then with Adjust you'll see the people credited with the development of Risc OS 3. – **Richard Molyneux, Bacup, Lancs.**

16-bit emulation

IS there such a thing as an Amiga Emulator for the A3000? My friend has a BBC Emulator for his Commodore Amiga so I thought that there would be a chance of its existence?

Could you tell me if there is such a thing and if it runs Amiga games how much memory would I need? – **Colin Anderson, Ayr, Scotland.**

● *The Amiga is quite a slow machine – it runs at 0.7MIPs (millions of instructions per second) the old BBC Micro ran at 0.5MIPs, the A3000 at about 4MIPs.*

But the Amiga has a number of dedicated graphics chips which the main processor can program to perform all the clever screen effects, sprite moving and so on.

So in terms of graphics power the Amiga beats the A3000. But it's because of these graphics chips that an Amiga emulator is difficult to produce and even if anyone got one running it would be very slow.

Incidentally, the Amiga's BBC emulator fails as soon as any program attempts to write to the screen directly, but the Archimedes' !65Host handles this perfectly.

All programs printed in this magazine are exact reproductions of listings taken from the running programs which have been thoroughly tested.

However, on the rare occasions when mistakes occur, corrections are published as a matter of urgency.

Should you encounter error messages when you type in the program, they will almost certainly be the result of your own typing mistakes.

Unfortunately we cannot answer personal programming queries concerning mistakes. Of course letters about suggested errors will be investigated without delay, but any replies found necessary will only appear in these pages

Long live 8-bit listings

I HAVE been collecting *The Micro User* since it started.

Would it also be possible to run an article on how to convert the old magazine listings to run on an A5000? Some of the old programs I now miss, in particular King Albert Patience.

If it is not a simple job to convert these programs is there a simple routine that could be written to run them in the !65host from the Desktop? – **Roger Wright, Sidcup, Kent.**

● *The trick to running 8-bit listings on the 32-bit machines is to put them in a ram disk – doesn't need to be more than 128k – put the listings into the ram disk and run !65Host.*

Once !65Host is running type:

```
*DIR RAM:$
```

*Now you can just type: CHAIN"prog" or *Exec !boot or whatever is needed to run the program. The whole 8-bit listings directory from the subscription disk can be copied into the ram disk and run with *Run !boot.*

In fact, King Albert Patience was one of our most popular programs ever and a 32-bit version was written and published. We included it on the cover disk last month.

As for other conversions ... well, it can be very time-consuming and is often not feasible, complete machine code games for example. We will publish them as and when people write them for us.

Want to write to us? The address is:

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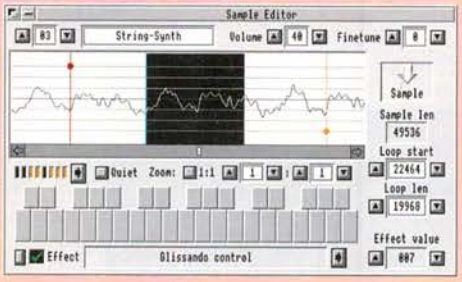
Digital Symphony

The Definitive Soundtrack Editor



Built in Sample editor, allows you to Cut and Paste parts of the sample. You can try out any of the 40 different special effects, and define a repeat loop by dragging visual markers.

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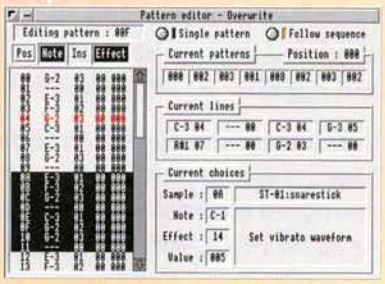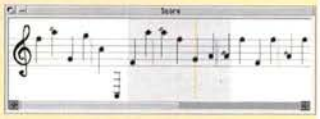

The Pattern Editor, used in conjunction with the Musical Notation score display, makes editing a track very easy. Once created each pattern can be slotted into the sequence, wherever you wish. Cut and Paste, Copy, Transpose, Exchange, etc... facilities are offered to enhance flexibility.

...but we are not alone in thinking that Digital Symphony is the best ever music sequencer for the Archimedes. Read what Richard Hallas of Risc User said. - Apr 93

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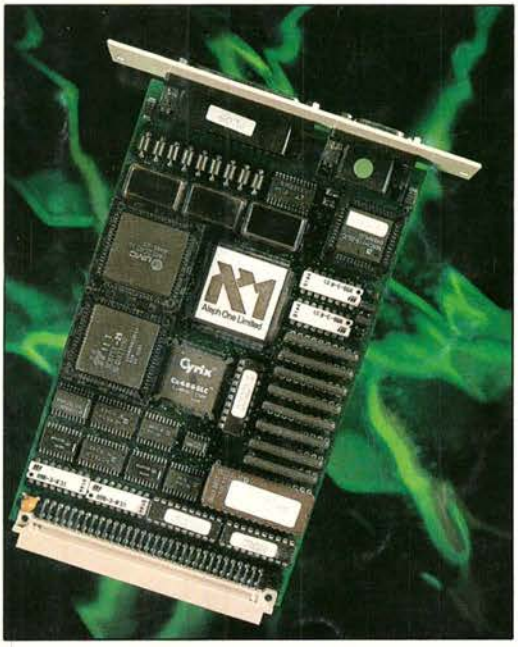

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